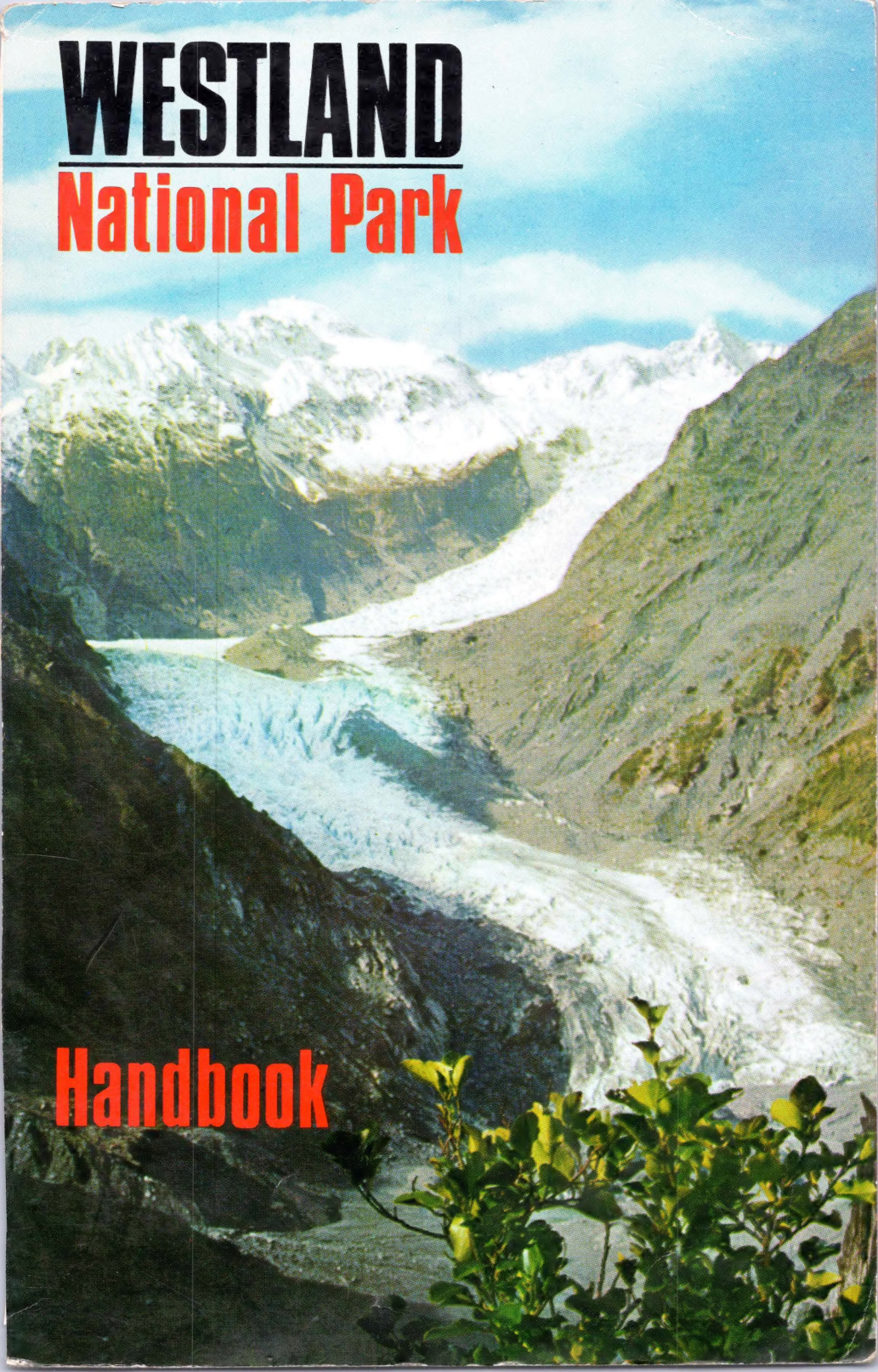
WESTLAND
National Park



Handbook

HANDBOOK

TO THE

WESTLAND

NATIONAL PARK

Edited by

L. W. McCASKILL

Published by the Westland National Park Board

Frontispiece:

Fur seal, Gillespies Beach. —*R. Warburton.*

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Front Cover:

Fox Glacier. In 8 miles it falls 8,000 feet to the terminal face 800 feet above sea level. —*Neville Hatwell.*

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FOREWORD

THIS handbook introduces you to "a great land uplifted high" whence rivers of ice flow down towards the sea through wooded valleys.

Westland National Park, although in its infancy, being constituted on 29 March 1960, is fast gaining in popularity, as it must be traversed by all who travel the highway linking Otago and South Westland.

There is much to interest the family man, as no special equipment is necessary to view the lakes with their reflections of snow-capped peaks and wooded shores, or the sub-tropical rain forests which run right down to the sea.

For the more adventurous the Copland Pass, Mount Tasman, Mount Dampier and dozens of other peaks always present a challenge.

May this handbook assist all visitors to experience in full measure the inspiration, enjoyment and other benefits that may be derived from mountains, forests, lakes and rivers.

E. N. YOUNG, Chairman.

Westland National Park Board,
Hokitika.

THE PARK

ABEL Tasman's log for 13 December 1642 reads as follows: "Observed latitude 42° 10′, longitude 171° 42′. Course E.b.N.; and sailed 144 miles. The wind S.S.W.: the same with a topsail breeze.

"Towards the middle of the day we saw a great land uplifted high. We had it S.E. of us, about 60 miles away. We shaped our course S.E., straight on towards the land. . ."

Tasman had discovered New Zealand. At the time his ships were west of what is now Greymouth and it is probable that part of the "land uplifted high" which he saw comprised mountains of the present Westland National Park.

The next visitor was Captain James Cook, who in the *Endeavour* in March 1770, sailed north from Fiordland to Cape Farewell. The nearest place to Westland National Park to which he gave a name was Open (Jackson's) Bay. Foggy weather kept the *Endeavour* well off shore, but he saw the mountain tops intermittently through the mist and he was able to record a brief description of the country.

"The country between the Mountains and the Sea consists of woody hills and Valleys of various extent both for height and depth and hath much the appearance of fertility, many of the Valleys are large, low and flat and appeared to be wholly cover'd with wood and it is very probable that great part of the land is taken up in Lak(e)s Ponds &C as is very common in such like places."

In May 1774, Cook again sailed up the west coast and described it as "unworthy of observation, except for its ridge of naked and barren rocks covered with snow. As far as the eye could reach, the prospect was wild, craggy, and desolate."

Towards the end of the eighteenth century, sealers made their main bases in the Sounds, but carried on their occupation at various places up the coast including Jackson's Bay

and the Wanganui River 90 miles north. These sealers would almost certainly have operated at Gillespies Beach and thus be the first white men to make contact with part of what is now Westland National Park.

In 1827 the French navigator, Dumont d'Urville, sailed down the coast and added some detail to Cook's original description.

From December 1846 to June 1848 Thomas Brunner made his famous journey from Nelson to Paringa. On 7 November 1847 he crossed the Waiho, two days later the Waikukupa, and the following day the Cook. His journey was along the coast and he evidently was not aware of the two huge glaciers so close at hand. " On Friday, 11 December, I turned my face homewards (from Paringa); first to rejoin my own natives, and then endeavour once more to see the face of a white man, and hear my native tongue."

In March 1851, Captain J. L. Stokes sailed in the *Acheron* up the coast from Milford Sound and named Mount Cook.

In 1859 two men, Francis and Young, sailed from Lyttelton in the *Mary Louisa* to inspect the west coast from the sea as part of their search for grazing land. Their log gives us the first published description of the Glaciers. " June 14th. About 30 miles to the northward of Mount Cook, and ten miles from the shore; clear, frosty morning; sun shining out upon the tops of a rugged snow-capped range of immense height . . . we saw what appeared to be a streak of mist running between the two peaks which form the summit of the mountains. Upon a nearer approach we concluded it must be a glacier. At noon, abreast of Mount Cook, close in shore, we could see distinctly that it was an immense field of ice, entirely filling up the valley formed by the spurs of the twin peaks, and running far down into the low land. It was a pale green colour, and appeared to be quite a mile in width towards the lower end of the valley."

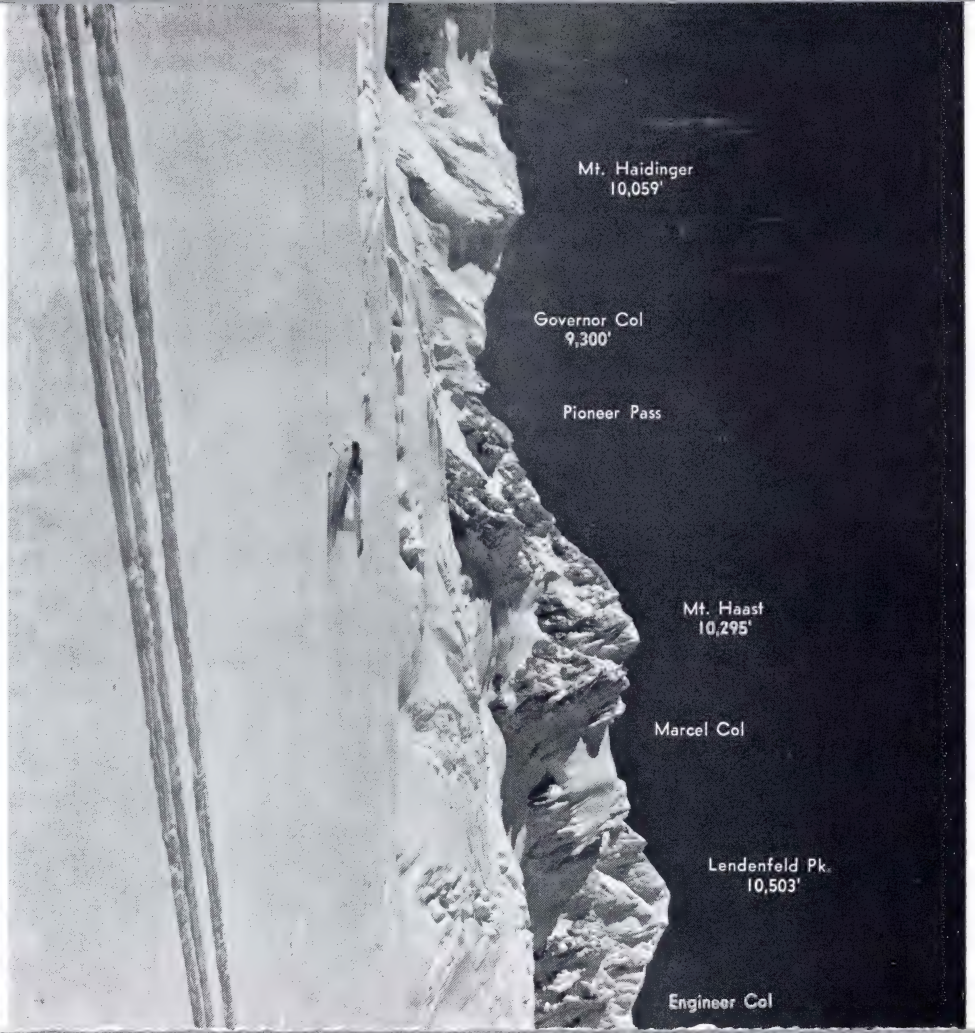
At Greymouth, on 21 May 1860, James Mackay, acting for the Queen, purchased from the Ngai Tahu for £300 the 7,500,000 acres lying between Kahurangi Point in the north, Milford Sound in the south and the crest of the dividing range to the east. This area included the whole of what is now the Westland National Park.

While most of the area of the Park has long been reserved for scenic purposes, it was not until 29 March 1960 that it was formally constituted the Westland National Park. The necessary Order-in-Council was signed at the historic meeting of the Executive Council held in Greymouth to mark the centennial of Westland. The area gazetted consists of 210,257 acres of high mountains, snowfields, glaciers, alpine grasslands and herbfields, forests, lakes, waterfalls and rivers. It is unique among the Parks of New Zealand in that it extends from sea-level to a height of 11,475 feet. It incorporates two of New Zealand's leading tourist centres at Franz Josef and Fox Glaciers and is traversed by the main highway which connects Westland and Otago via the Haast Pass.

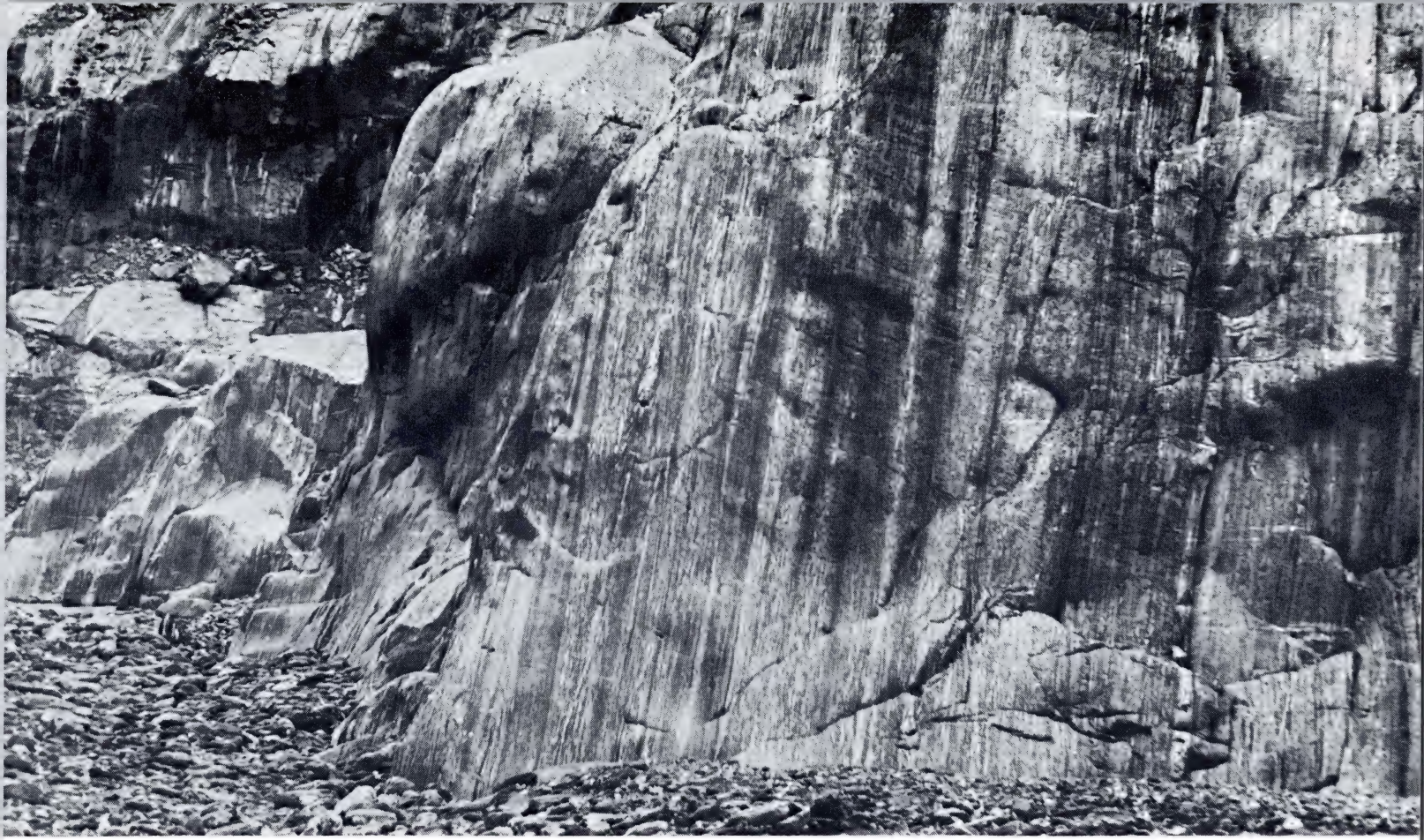
Travelling south, introduction to the Park is made at Lakes Wahapo and Mapourika, which with their surrounding bush make up the northern section of 9,000 acres. The township of Franz Josef Glacier is six miles farther south at the northern fringe of the main portion of the Park, with an area of over 200,000 acres. Here is situated the Park Headquarters where Park Rangers are available to give information and advice. A road journey of 15 miles traverses magnificent bush covering ridges and valleys and leads to the township of Fox Glacier, where there is a Park Sub-headquarters staffed by Park Rangers.

Responsibility for the care and development of the Park rests with the Westland National Park Board which consists of eight members together with the Commissioner of Crown Lands as Chairman. The Park is administered in terms of the National Parks Act 1952 and of the General Policy of the National Parks Authority of New Zealand. The Board appeals for the full co-operation of all visitors so that the purposes of the Act may be fulfilled—" preserving in perpetuity as National Parks, for the benefit and enjoyment of the public, areas of New Zealand that contain scenery of such distinctive quality, or natural features so beautiful or unique that their preservation is in the national interest."

The front of the Southern Alps, looking north-east from above the Franz Josef Glacier township. The Alpine Fault extends along the steep western front of the mountains, and morainic deposits make up the ridges to the west. The forest-covered ridge in the foreground is part of a terminal moraine thought to be about 11,000 years old. ***—R.N.Z.A.F.***


Mt. Haidinger
10,059'
Governor Col
9,300'
Pioneer Pass
Mt. Haast
10,295'
Marcel Col
Lendenfeld Pk.
10,503'
Engineer Col

Part of Fox névé. —*Whites Aviation.*



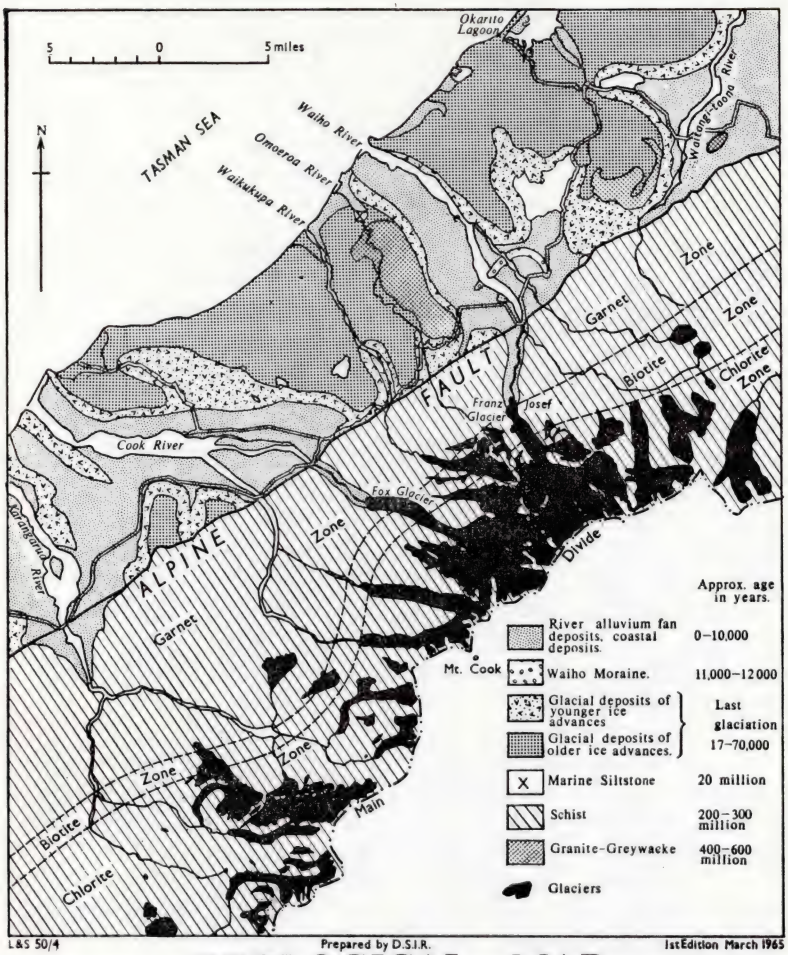
Bare rock walls left by retreat of the Franz Josef Glacier, showing typical finely-banded schist.

—*W. A. Sara.*

GEOLOGY

THE outstanding topographic contrast between the coastal lowland and the Southern Alps, emphasised by the grandeur of the steep north-western face of the mountains, is the result of the geological processes of glacial and river erosion and deposition, and of earth movements, mainly during the last few million years. The sequence of events, simple in outline, is complex in detail. The mountains have risen faster than erosion could wear them down, even the erosion by glaciers of the Ice Age; debris of this erosion, carried down by ice and rivers, covers the hard rocks that underlie the coastal lowlands. The boundary between the rising ranges and the lowlands is clearly marked by a major geological break through the earth's surface, the Alpine Fault, which is the greatest fault in New Zealand and a feature of great magnitude on a world scale.

Apart from river deposits, the rocks on the two sides of the Alpine Fault are completely different in age. To the west of the fault only a little solid rock shows at the surface, but what there is, for example along the main road south of Docherty Creek, is mainly hard greywacke and argillite deposited beneath the sea as sand and mud and recrystallised by heat provided during the cooling of the adjoining granite that was intruded into it as a molten rock. The greywacke and argillite may be some of the oldest rocks in New Zealand, perhaps 500 to 600 million years old; the intruding granite may not be much younger. Practically nothing is known about the later geological history of this area west of the Alpine Fault until about 20 million years ago; then siltstone, a tiny area of which crops out in the Omoeroa River, was laid down beneath the sea. Minute fossil shells reveal the age of this rock.



GEOLOGICAL MAP

East of the Alpine Fault the rocks are mainly schists, rocks in which the parallel arrangement of the minerals results in a tendency for the rock to break into parallel-sided fragments. These rocks were originally sand and mud deposited beneath the sea, but great changes have taken place in them as a result of burial many miles beneath the earth's surface at a time when earth movements were strongly folding the rocks. The greater the depth of burial the greater were the temperatures and pressures, the greater

were the consequent changes in the original rock and the better was the resulting parallel arrangement of new minerals. These progressive changes can be followed westwards from the main divide to the Alpine Fault. At the main divide, the greywacke and argillite are very hard, but there have been few mineral changes. To the west a new mineral, chlorite, is common, and the rocks begin to look more like schist. Then biotite, a dark coloured mica, characterises the schist. Closer still to the Alpine Fault, garnet, unfortunately not of gem quality, is fairly common with the biotite.

The age of the original sediments that were changed to schists is not known for certain, but it is likely that these rocks are 200 to 300 million years old. The metamorphism of the schists and the accompanying folding are generally thought to have taken place about 150 million years ago. The folding was extremely complex in detail, particularly in the schists, where tiny folds seen in some hand specimens of the rocks are matched by larger folds up to two or three miles across that are revealed by detailed geologic mapping. As well as folding, faulting of the rocks took place, and the beginning of movement along the line of the Alpine Fault may date from this time. Along the Alpine Fault itself the schists are highly crushed and sheared, such rocks being well exposed on the main road south-west from the Waikukupa River to the Cook Saddle. On completion of the earth movements the metamorphism ended, but the schists were probably still deep down below the surface of the earth. Their main uplift took place during the period of earth movements of about the last five million years, and was greatest immediately east of the Alpine Fault, so that the most highly metamorphosed rocks are found there.

The period of the Ice Age coincided with the period of the main uplift of the Southern Alps; indeed, without that uplift there would probably have been no major glaciers. There were numerous main cold periods (glaciations) during the Ice Age, separated by periods of warmth like the present day. Such were the powers of erosion of the glaciers, however, that the records of the earlier glaciations were all but destroyed during the last glaciation, and only fragmentary evidence of some of them and of warm periods are found in the coastal area between Waiho and Waikukupa Rivers. There the beach gravels of Cement Hill, formerly worked for gold, are

a remnant of a shoreline deposit of one of the warm periods, now raised by earth movements far above sea-level.

The deposits of the last glaciation comprise mainly glacier-deposited boulder gravel with a silty-sand matrix, making up prominent ridges that wind through the bush-covered lowlands, but gravel, sand and silt deposited by melt-water are also widespread. The shape of these ridges is most clearly seen on aerial photographs and is not obvious on the ground; the irregularity of the topography is, however, well seen on the road to Gillespies Beach, once the Clearwater River has been crossed. The pattern of these ridges is important in helping to determine the extent of ice during the last glaciation. It is clear that the ice margin fluctuated, and that there was a main stage during the glaciation when the ice retreated well towards the mountains, only to advance again, though not quite so far. Before this temporary retreat, ice from the valleys spread over the whole of the coastal lowlands apart from the area of the Omoeroa Range, and extended beyond the present coast. The major advance that followed the temporary retreat took place probably 14–17,000 years ago, and carried the ice from the Franz Josef Valley as far as the northern end of Lake Mapourika and down the Waiho Valley as far as the coast; the moraine ridge formed by glacial debris along the margin of this glacier can be seen prominently in the forest along the western side of the Waiho Valley, 500 feet or more above the valley floor. Another moraine, this from the Waitangi Glacier, thrust westwards by the Whataroa Glacier, encloses Lake Wahapo, except at the eastern end. Ice from the Cook and Fox Glaciers filled the Cook Valley. Retreat of the ice, accompanied by stagnation of huge areas, left depressions most of which were filled by alluvium, but where there were no main rivers they were occupied by lakes. The retreat was probably accomplished by about 12,000 years ago.

Although the last glaciation was over, important fluctuations in the glaciers still took place. A moraine ridge in the form of a quarter of a circle lies two and a half miles north of Franz Josef township, and is crossed by the main road at Stony Creek; the southern part of the loop of moraine has been destroyed by the Waiho River. The ice advance recorded by this moraine, tentatively thought to have taken place about 11,000 years ago, was minor compared with those

of the last glaciation, but was far more important than the fluctuations of the past few hundred or few thousand years recorded by gravels and morainic deposits in the Waiho Valley upstream from the main road bridge.

Throughout the Ice Age, movement continued at the Alpine Fault, and there is evidence that even some of the younger river gravels in the Franz Josef area have been uplifted by faulting. At Hare Mare Stream, about 200 yards upstream from the road bridge, schist has been thrust over morainic gravel. It is clear that the geological processes of earth movement and of glacier fluctuation that have produced the dominant geological and topographic features of the region are still continuing.

WEATHER

THE weather in the New Zealand region is dominated by a succession of eastward-moving anticyclones which usually follow each other at intervals of several days, separated by troughs of low pressure. As the anticylone centres mostly pass to the north, low-level winds are generally westerly over the South Island, with north-westerlies ahead of each trough and south-westerlies following. At the level of the mountain tops, westerlies predominate and are much stronger than at lower levels. Westerly or northerly airstreams blowing from the Tasman Sea on to the South Island are deflected around the mountain barrier or rise up over it. The mountains thus cause large-scale as well as local modifications to the patterns of wind flow, and when the air rises over the mountains, cloud and rainfall are increased. On the other hand, southerly or easterly airstreams, which are of less frequent occurrence, usually lose most of their moisture in crossing the South Island, and bring mainly clear skies on the West Coast.

Westland National Park extends from sea-level to about 11,000 feet and is nowhere far from the sea. Mountain and maritime influences are thus at their greatest and a wide range of climate is experienced. On the highest peaks and ridges calms are infrequent; west winds predominate strongly at all seasons (over all, about 55 per cent are between S.W. and N.W.); and there is little change in the average speed (25 to 30m.p.h. at 10,000 feet) from month to month. Mountaineers have reported that in the high basins and on the lower ridges west of the divide, the winds are on the whole much lighter than they are on the highest tops, and tend to be lighter than at similar levels east of the divide. Nevertheless strong winds and gales are frequent, especially in

places where a local concentration of wind flow is caused by the topography.

At low levels, in the valleys and over the coastal lowlands, calms are common and winds are comparatively light, averaging probably not more than seven or eight m.p.h. in open situations. West or north-west winds over the open sea tend to be deflected to blow as northerlies over the land. At Fox Glacier and Franz Josef Glacier north and north-east wind directions predominate strongly, although there are also a considerable number of southerlies and south-westerlies and it is calm more than half the time. In and near the mountain valleys, wind directions are largely controlled by the shape of the land, and strong winds blow only occasionally. At Franz Josef Glacier a strong south-easterly gale in August 1954, which uprooted and broke off large forest trees, was said to have been the worst for 60 years. Down-valley (katabatic) winds caused by cold air draining from higher levels are most often experienced at night and in the early mornings in winter, while sea breezes blow mostly near the coast on fine summer afternoons.

Rainfall is frequent and heavy. Near the coast the average yearly total is about 120 inches. At the foot of the mountains, as at Franz Josef and Fox, it is 175 to 200 inches on about 190 rain days; in the mountains it probably exceeds 300 inches, mostly falling as snow above about 7,000 feet. When rain falls it is usually heavy and at times is accompanied by lightning and hail. On the coast, thunderstorms are reported on an average of about 15 days a year but they are much more frequent in the mountains. A rainfall of 19.3 inches has been recorded in a day, and 48.7 inches in a single month (April 1928). On the average, winter months have the lowest rainfall and spring and summer the highest. There have been a very few long dry spells with little or no rain for five or six weeks, mostly in July and August, but on average there are only one or two spells of 10 to 15 days without rain per year (at Franz Josef). Near the coast, snow is rare. At Franz Josef Glacier (420 feet above sea level) it is reported about once per year and occasionally lies briefly to a depth of a few inches. On higher ground, snow falls frequently and there are occasional falls down to 3,000 to 4,000 feet even in summer. In winter and spring the snow line is usually at 4,000 to 5,000 feet, retreating to 7,000 to 8,000 feet in late summer and autumn.

By comparison with most other parts of New Zealand the lowland areas of the West Coast do not experience wide extremes of heat or cold. Summer days reach an average maximum air temperature of about 68°F., and seldom reach 80°F. In winter, ground frosts are frequent, and there are a few in summer in sheltered flat areas. Further details for the Franz Josef Glacier climatological station are given in the table.

Air temperature generally decreases with increasing height by two to four degrees (F.) per thousand feet. Freezing temperatures are usually found above 4,000 to 6,000 feet in winter and 7,000 to 10,000 feet in summer, but there are occasions in summer when freezing level is well above the mountain tops. In these conditions (especially when accompanied by warm rains) there may be rapid thaw with snow too soft for good skiing or climbing and danger from snow and ice avalanches.

In relation to the amount of rain on the West Coast, cloudiness is not excessive, and the amount of sunshine is higher. At Hokitika and Haast the average duration of bright sunshine is 1,855 and 1,816 hours respectively, or 43 and 44 per cent of the sunshine possible at these sites. (For comparison, the figure is 45 per cent at Wellington and Christchurch.) No measurements of sunshine are made in the park. Observations of cloud at 9 a.m. at Franz Josef Glacier show an average of about 70 per cent of cloud cover. All types of cloud can be seen in the Park, from the dense, grey overcast of nimbo-stratus in heavy rain to the scattered, bright patches of cumulus and alto-cumulus of fine weather. An approaching depression or front may be heralded by the development of bands of wave cloud—cirrus or alto-cumulus—high and stationary over the divide, or by an advancing high-cloud shield first seen in the west and gradually becoming lower and thicker as it spreads across the sky. Often this storm-cloud sequence can only be properly seen from high up, as a layer of low cloud—stratus or strato-cumulus—may have formed earlier over the coast and spread like a sea over the foothills. The interval between the appearance of these cloud signs and the onset of rain cannot be estimated with confidence without a weather map, as it depends on the size of the approaching disturbance and the speed of its advance. It may be anything from a few hours to several days.

From the mouth of the Waiho River. Scattered fine weather cumulus clouds over the coastal area. Bands of high clouds over the divide and a thin veil of cirrus cloud may indicate a coming change.
—National Publicity Studios.

Heavy cumulus clouds over Fox Glacier. The Jewell Glacier is left centre.
—National Publicity Studios.

Franz Josef Glacier—July 1953. —*Whites Aviation.*

Franz Josef Glacier—May 1961. —*Geological Survey.*

Franz Josef Glacier—June 1965. —*Geological Survey.*

Franz Josef Glacier—October 1966. —*Geological Survey.*

Above: Rimu trees tower above the road to Gillespies Beach. —*J. H. Taylor.*

Facing Top: Fox Glacier surface. The centre moves faster than the sides. —*National Publicity Studios.*

Facing Bottom: Fox Glacier, terminal face, October 1965. —*J. H. Taylor.*

Kiekie (*Freycinetia banksii*), a scrambling climber. —*J. H. Taylor.*

Slipper orchid *(Dendrobium cunninghamii)*, an epiphyte or perching plant. —*J. H. Taylor.*

Rata vine *(Metrosideros diffusa)* with white flowers. —*J. H. Taylor.*

South Island Robin.
—*M. F. Soper.*

South Island Tomtits.
—*National Publicity Studios.*

CLIMATOLOGICAL TABLE—FRANZ JOSEF GLACIER (Elevation 420 feet).

Temperatures (°F)	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sept.	Oct.	Nov.	Dec.	Year
Mean ½ (Max + Min)	59	59	57	54	49	45	44	46	49	52	53	57	52
Mean Daily Maximum	68	68	66	62	57	53	53	54	57	60	61	66	60
Mean Daily Minimum	50	51	49	45	42	38	36	37	40	44	45	49	44
Highest Maximum	87	79	81	76	70	62	67	66	70	73	73	82	87
Lowest Minimum	39	38	37	31	27	28	27	27	30	31	31	37	27
Rainfall (inches)													
Mean	18.3	19.8	15.3	17.6	16.6	11.4	12.5	15.1	14.9	20.3	19.4	16.8	198.0
Maximum Daily Rainfall	13.8	12.9	11.7	9.9	8.6	6.8	11.0	7.8	8.0	19.3	10.2	10.0	19.3
Days of Rainfall (0.01in or more)	15	13	15	15	15	14	14	15	17	20	19	18	189
Days of Snow	—	—	—	—	0.1	0.1	0.1	0.2	0.1	—	0.1	—	0.7
Days of Ground Frost	0.2	0.2	0.2	2.8	8.7	16.0	18.7	16.4	13.2	5.7	2.0	0.3	84.4
Days of Frost on Screen	—	—	0.1	0.1	1.2	3.1	5.3	3.2	0.4	0.2	0.1	—	13.9

Period of Observations: Rainfall 1926-1964, otherwise 1953-1965.

In unsettled periods of strong westerly winds, cold fronts or low-pressure troughs may follow in rapid succession for many days. Each may give a period of heavy rain sometimes accompanied by thunder, lightning and hail. In between, the weather may clear for brief periods of sunshine on the coast, but often in the mountains there is only a temporary easing of the rain or snow. Occasional slow-moving or stationary anticyclones centred near the South Island account for most of the extended periods of fine, settled weather. Then if the wind flow on the West Coast is between south and east, the only clouds are likely to be broken high-level alto-cumulus and cirrus layers, or patches of morning mist and stratus around the foothills. These sometimes develop during the day into towering cumulus or cumulo-nimbus to give scattered afternoon showers.

Visitors to the Park must be prepared for rain in large quantities at any time of the year, remembering that many of the unique features—snowfalls, glaciers, waterfalls and the luxuriance of the vegetation—depend on the high precipitation. Those who go high must be prepared for severe conditions of wind, weather, temperature and visibility, as weather changes can take place very quickly on these exposed mountains.

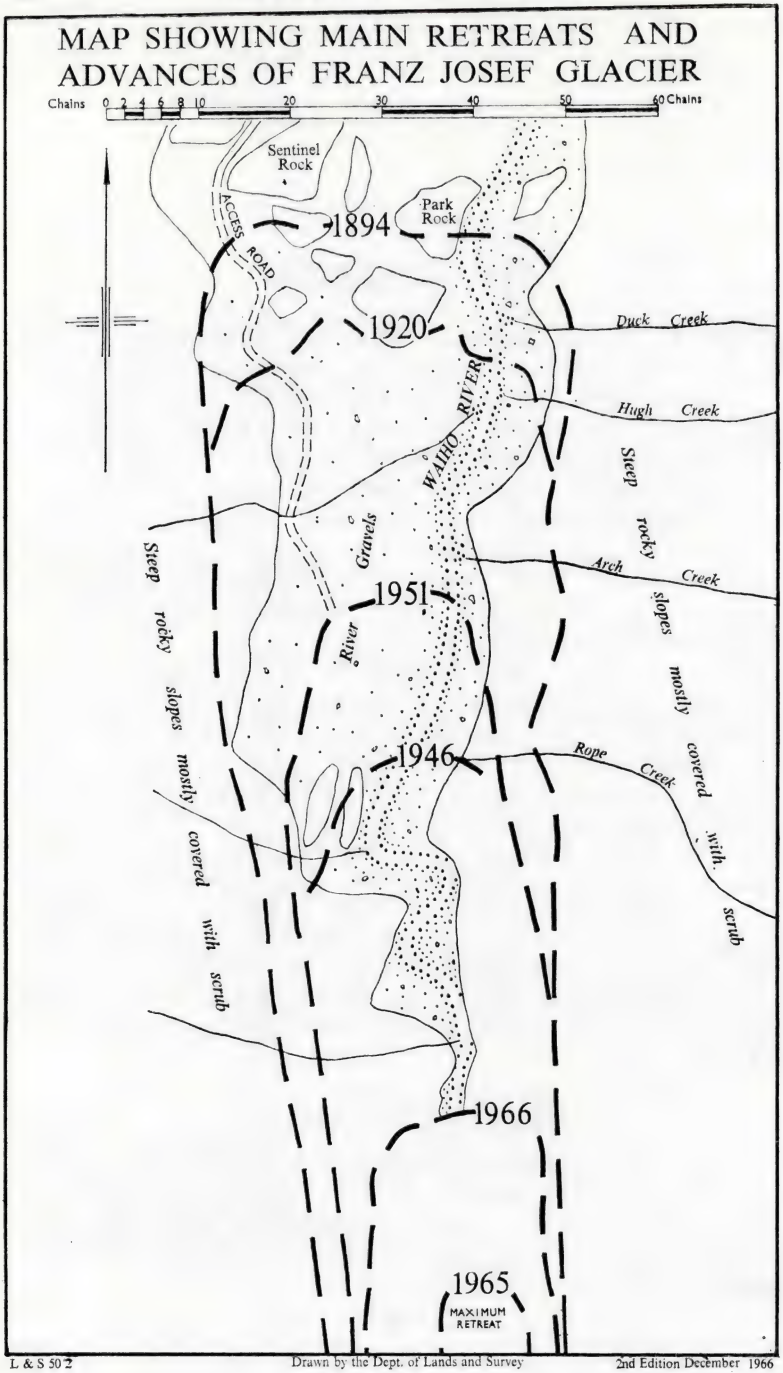
THE GLACIERS

OF the many glaciers within the boundaries of the National Park, only two, the Franz Josef and the Fox, are readily accessible to most tourists. It is these two that Julius Haast (later Sir Julius von Haast) visited in 1865, this being the first recorded visit of a European. Haast was then geologist to the Provincial Government of Canterbury, when Westland was still part of the Canterbury Province. He was followed in later years by A. P. Harper, T. N. Brodrick, J. M. Bell, C. E. Douglas, W. Wilson and many others, all of whom have contributed significantly to the history of the glaciers.

The approach to both glaciers is through typical Westland bush and fern, much of which is growing on the older moraines deposited in the valleys by the glaciers in past years; the younger moraines and outwash deposits support only scrub vegetation and this becomes notably lower in stature and sparser as one comes closer to the terminal face of the glaciers. Both the Franz Josef and the Fox Glaciers originate in the highest part of the Southern Alps, their névés being by far the largest on the western side of the divide. Snow is brought by the prevailing westerly winds, especially from the south-west in winter, and although there are no figures available for the precipitation on the snowfields, this is known to be high, probably over 200 inches, well distributed throughout the year.

FRANZ JOSEF GLACIER

Named after the then Emperor of Austria-Hungary, Franz Josef, the anglicised version, Francis Joseph, was used for a number of years and various versions of the name were subsequently used until it became officially known as Franz Josef.


MAP SHOWING MAIN RETREATS AND ADVANCES OF FRANZ JOSEF GLACIER
Chains 0 2 4 6 8 10 20 30 40 50 60 Chains
Sentinel Rock
Park Rock
ACCESS ROAD
1894
1920
1951
1946
1966
1965
MAXIMUM RETREAT
Duck Creek
Hugh Creek
Arch Creek
Rope Creek
WAIHO RIVER
River Gravels
Steep rocky slopes mostly covered with scrub
Steep rocky slopes mostly covered with scrub
L & S 50 2
Drawn by the Dept. of Lands and Survey
2nd Edition December 1966

From the snow and icefields at the main divide some 9,000 feet above sea level the glacier descends for six miles at a gradient of about 1,400 feet per mile to the terminal face at about 900 feet above sea-level, 200 feet higher in altitude than when first observed by von Haast.

More is known of the fluctuations of the Franz Josef Glacier than of any other glacier in New Zealand. When first observed by von Haast in 1865, the terminal face of the glacier was at the lower side of Sentinel Rock, the largest of the group of roches moutonné which are prominent in the valley.

The glacier at that time was estimated to be approximately 3,000 feet wide. In 1893 the glacier was visited by A. P. Harper, who carried out the first survey of the terminal face, and this survey has been the starting point for many of the published accounts of the glacier variations since that time. According to Harper, the glacier had receded 300 feet since Julius Haast's visit and it is known that this recession continued until about 1907, when a sudden rapid advance began; by 1909 the ice pressure had wrecked a gallery track along the east wall of the valley in spite of attempts to prevent that by blasting the glacier. The terminal face reached about the same position that it occupied in 1894. Then occurred 800 feet of retreat from 1910 to 1920, followed by a small advance which continued until 1934. The subsequent retreat proved to be a major one, totalling some 3,000 feet up to 1946. During this retreat a large lake formed in the valley between the terminal face and Park Rock, the large roche moutonné in the centre of the valley. With the re-advance of the glacier in 1946 the lake gradually became smaller as the Waiho River filled it with silt and gravel, and in 1949 a flood following six days of particularly heavy rain brought down so much debris that it almost disappeared. (The Maori meaning of the name "Waiho" is "smoking water"; the thin fog layer is caused by chilling of warm moist air by contact with icy-cold water of the river.) Continued melting of the buried ice in the valley floor is producing deep, circular ponds and slump cracks and scarps in the outwash gravels. The re-advance amounting to about 1,000 feet lasted only until late 1950 and since then the retreat was continuous until May 1965. For a number of years this latest recession appeared to be fairly slow, but in the years 1957-58 the recession was 900 feet, and for the year 1961-62 its reces-

sion was 1,000 feet. From 1951 to May 1965 the glacier had receded 5,000 feet, and since Harper's survey of 1893 its total recession has been about 7,500 feet. Beginning about 1962, growth in thickness at high levels was observed and this has continued. At time of writing (December 1966) the glacier is advancing. Since June 1965 it has advanced 1,150 feet and measurements of daily advances of up to five and a half feet have been recorded. At no time has the daily advance been less than one foot. The terminal face has increased in height from 100 feet to 500 feet.

With the rapid advance and terrific build-up of pressure, the glacier has become extremely crevassed and access via the glacier to huts or névé is virtually impossible.

It is interesting to note that generally each time the glacier has re-advanced after a retreat, the advance has been less than the distance it has retreated.

The 1950 advance left a small terminal moraine which can be seen in the eastern part of the Waiho River valley between Arch and Rope Creeks. On the walls of the valley can be seen well-defined trimlines of several ages below which the vegetation was scraped away by advancing ice. The highest line, now recognisable below the stag-headed forest giants, especially of rimu, was formed about 1750, when the glacier attained its largest size of recent centuries. There has been too little time since then for a mature forest to develop on the new surfaces of bare rock, glacial till and outwash deposits.

Like all glaciers, the Fox and the Franz Josef have been formed from nothing more than snow. The transition from soft, white snow to hard, blue ice begins in the high snowfields in which the glaciers have their sources. There, much of the year's precipitation falls as snow. Some of this will melt away each summer, but in most years some remains from one winter to the next. On some snowfields pits have been dug and these show a succession of layers of ever-harder and closer-packed snow beneath the soft, loose snow of the last fall. The changes that take place as more snow is added to that already on the snowfield are not difficult to envisage. New snow contains a high proportion of air, trapped by the tiny, angular snow crystals. As more snow falls, the weight causes the crystals in the lower layers to pack more closely

together, forcing out some of the trapped air. This process continues year by year with each new snowfall.

There is a limit to the extent to which dry snow will pack together and the final conversion of snow into ice is accomplished by one or two other processes. Summer meltwater will soak into the snow; under its influence the snow crystals will become rounder and thus will pack still closer together. Then, as the pressure builds up with more snow, the ice crystals in the lower layers fuse wherever they touch to form new, larger crystals. As they do so, the remaining entrapped air is isolated into individual bubbles; by this time instead of recognisable snow we are left with clear ice. The more pressure it undergoes, from the weight of snow above it and from the shearing and flowing movements of the glacier, the clearer and bluer it will become.

The depth of snow which is necessary before this transformation into ice can occur varies from one glacier to another depending on conditions of moisture and temperature, but a depth of approximately 65 feet of snow is probably necessary to produce clear glacier ice. Even then we do not really have a true glacier if the term is taken to mean a moving body of ice. A deep snowfield, even with ice at its base, does not give rise to a glacier until there is so much snow that the weight forces the lowest layers of ice to flow downhill out of the snowfield basin. It is estimated that as much as 150 feet of snow and ice may be needed before this can occur. The changes caused by the pressure of so much snow and ice reduce still further the amount of air in the lowest layers, resulting in the clear blue ice that the visitor sees in the crevasses of the icefall.

A glacier travels in much the same way as a river, with a faster rate of movement in the middle than at the sides. Some idea of the speed at which the Franz Josef moves was obtained after an aeroplane crashed on the glacier just over two miles up from the terminal face in November 1943. The wreckage was broken up by the glacier and different parts took different courses as they travelled towards the terminal face. Parts of the aeroplane were seen at the terminal face in February 1950, six years and four months after it had crashed. From the distance it had travelled and the time taken, it was established that its average daily rate of movement was about five feet. As it is known that some parts had

moved across the glacier on their downward journey, the fastest rate of movement will have been much greater than five feet per day, due to the faster rate of flow in the middle of the glacier.

Some idea of how the glacier has wasted away, since 1951, can be gauged from recent surveys. A survey at its terminal face in May 1963 showed the glacier to be not more than 400 to 500 feet wide. The thickness of ice at the terminal face was less than 100 feet where in 1951 there had been at least 500 feet of ice. High on the main icefall of the Franz Josef, evidence of shrinkage of the glacier was indicated by a large exposure of bare rock.

FOX GLACIER

First visited by Sir Julius von Haast in 1865, the Fox Glacier was originally named the Albert, but was later changed to Fox as a compliment to Sir William Fox, who visited the area during his term as Premier of the colony. Albert has been retained for the upper reaches of the glacier.

Situated 15 miles by road to the south of Franz Josef, the Fox Glacier, like the Franz Josef, descends from the snowfields of the main divide some 9,000 feet above sea-level for a distance of eight miles at a gradient of about 1,000 feet per mile to the terminal face, 800 feet above sea-level. The Fox Glacier was mapped in great detail by Douglas and Wilson in 1894-95 and the terminal face at that time was about 1.6 miles farther down than it is now, at the place where the north access road swings around the sheer cliffs and where the white stripes are painted on the rock face. But since the original mapping only a few rather casual observations have been made, and more recent history is rather poorly documented as compared with that of Franz Josef. Some observers claim that in the period between 1890 and the late 1930s there was little change in the position of the terminal face. There has been a great decrease in thickness since 1894-95, when the ice was over 1,200 feet thick at the place where the terminal face is now. It is not known how similar the history of this glacier has been to that of the Franz Josef Glacier, but because these two glaciers are so close to one another it seems reasonable to expect that the variations of the Fox Glacier have been generally similar to those of the Franz Josef and it is known that since the late 1930s at least, this has been the case.

Weka. —*M. F. Soper.*

Pukeko. —*M. F. Soper.*

Tui on Kowhai. —*M. F. Soper.*

Bellbird on Flax. —*M. F. Soper.*

Crested Grebe on floating nest.
—*M. F. Soper.*

Black Teal or Scaup.
—*M. F. Soper.*

OTHER GLACIERS

On the western slopes of the Southern Alps all glaciers appear to have shown the same trend.

They are fed from the snowfields high up in the mountains and are therefore dependent on fairly frequent and heavy falls of snow to maintain their volume. The nourishment of the glaciers is especially favoured by south-westerly winter storms, and melting of ice is greatly hastened by north-westerly summer rainstorms. Precipitation figures that have been accumulated since 1894 suggest that advances of the glaciers follow periods of heavy winter snows, and that retreats are consequent especially on periods of meagre snowfall, the effect being seen at the terminal face after a time lag of three to five years. After 1951, for over a decade, with the exception of two years, the rainfall was below or near to average, and glacier recession was the order of the day. Beginning in 1963, a reversal in trend was noted at higher levels in the collecting basins and now this trend has continued for three years with a wave of thickened ice migrating down the glacier trunks of the Franz Josef and especially of the Fox, where advance of the terminal face was noted in the winters of 1964 and 1965.

Although the Franz Josef, Fox and other glaciers on the western slopes of the Southern Alps have been receding generally since 1951, they have not been alone in this respect. Such well-known New Zealand glaciers as the Tasman, Murchison, Mueller and Hooker on the eastern slopes of the Southern Alps have all shown the same trend.

Information from overseas indicates that most of the glaciers in other temperate parts of the world had been in general recession since their time of maximum extension of recent centuries, about 1750, but since 1945 many have begun to re-advance.

RIVERS AND LAKES

WITH its mountainous terrain and high precipitation as rain and snow, the region is well dissected by rivers and streams, the three main rivers rising in the Park and flowing through it to the sea being the Waiho, Cook and Karangarua. These three rivers and their main tributaries occupy glaciated valleys and are fed by melt-water from numerous glaciers in their headwaters, causing the summer flow to be considerably greater than that in winter. Flash floods, as a result of torrential rain, are common. The glaciers have diminished to a greater or less extent, with the Fox and Franz Josef Glaciers still reaching comparatively low levels. The melt-water issuing from the snouts of these glaciers forms the Fox and Waiho Rivers, the characteristic " milky " appearance of these rivers caused by finely powdered rock testifying to the effectiveness of glaciers as corroding agents.

In their course from the mountains to the sea, rivers, in general, can be broadly classified into a number of phases. A typical river rises in the mountains or high hills where a number of steep tumbling torrents join together to form the main stream, or the river may emerge fully grown from the snout of a glacier. As the river proceeds towards the sea, angular detritus is reduced in size, rounded, sorted and spread over wide stony flood plains. Later the river assumes a placid meandering course through silt deposits, finally reaching tidal water and the sea. Thus the course of a river can be divided into four sections—the Mountain or Torrent Phase characterised by steep slopes, falls and gorges; the Shingle Phase below the mountains where the river, still steep, flows in shallow braided channels over a wide stony bed; the Silt Phase where the river flows in a narrow meandering channel through a fertile flood plain; and finally the Tidal Phase.

Provided the rivers are long enough, all four phases are generally developed but, in this region of Westland, the rivers are short and steep and do not develop beyond the shingle phase. With a length of 15 to 20 miles from their headwaters on the main divide to where they meet the sea, the rivers are steep and fast-flowing and within the bounds of the Park are still, in the main, in the mountain or torrent phase.

With their milky waters tumbling over boulder-strewn beds and numerous cataracts and waterfalls from the steep valley-sides swelling their flow, the rivers in the region add to the many striking and attractive features of the Park.

The largest lake in the Park is Lake Mapourika between Whataroa and Franz Josef. This pretty bush-fringed lake is about three and a half square miles in area and the main highway skirts its eastern shore. The outlet of Lake Mapourika is the Okarito River, which flows down to the large Okarito Lagoon at the sea coast. Also flowing into the Okarito River is the Wahapo River, which rises in the lake of the same name. Lake Wahapo is one and a quarter square miles in area and is seen by the traveller on first entering the Park from the north. The road follows along the southern shore of the lake which, like Mapourika, is bush-fringed and the reflections of bush and mountains can be very beautiful. Water from Lake Wahapo is taken by race and pipeline to a station generating electricity on the banks of the Okarito River.

Famed for its spectacular reflections of Mount Cook and its neighbouring alpine peaks is Lake Matheson, a small lake a few miles to the west of the Fox Glacier township. The outflow from Lake Matheson is into the Clearwater River, a tributary of the Cook River.

To the north of Lake Matheson, in the higher country between the Clearwater and Waikukupa Rivers, lie a number of small lakes, Mueller, Gault, Lyttle and Gibbs.

All of the lakes lie in depressions left as the ice retreated and sufficiently remote from main rivers not to be filled with alluvium.

THE VEGETATION

THE lasting impression of Westland National Park must be one of towering, ice-clad mountains glimpsed through forests of subtropical luxuriance. Where the main road twists through the foothills, the commonest large tree in these forests is rimu, easily recognised by its bronze-coloured foliage and slender, pendulous twigs. Rimu is a conifer, but like most New Zealand conifers, it is assigned to the podocarp family because it has berry-like fruit instead of cones. Smaller than rimu, but just as common, is kamahi, which has dull-green leaves with shallow notches along the margins and tiny, white flowers that are grouped into conspicuous bottlebrush-like inflorescences. Many other trees also occur in the hill forests, including rata, the glory of Westland when its brilliant display of red flowers appears in January and February; miro, a podocarp with dark-green, yew-like foliage; quintinia, with crinkly-edged leaves that glisten silvery in the sunlight and broadleaf, with rounded, yellow-green leaves. There are several kinds of ivy tree, including five-finger and the lancewood, with its straight, unbranched saplings crowned with narrow, stiff leaves two feet long. Several small trees with thinner, softer leaves predominate in steep gullies, especially the deciduous native fuchsia, wineberry with broad, sharply serrated leaves, and pate, which has large compound leaves made up of five to seven leaflets radiating from a single stalk.

Mikimikis or coprosmas are the most abundant of the shrubs that occur scattered or as tangled thickets in the undergrowth. These have rather sparse, more-or-less oval leaves less than a quarter inch long, borne on slender, interlacing twigs that branch at wide angles. There are separate male and female plants and the latter produce berries that are orange, red, blue or white according to the species.

Other unrelated shrubs have the same small-leaved, twiggy appearance, including weeping matipo, which has little heart-shaped leaves that are attached by the "point" of the heart, and a profusion of bright blue berries; thickets of a small-leaved myrtle; *Neopanax anomalum,* which certainly is anomalous by comparison with other ivy trees; and *Pittosporum crassicaule,* an equally anomalous relative of the larger-leaved, better known pittosporums such as kohuhu and lemonwood. Certain shrubs with this form grow up into trees with very different, much larger twigs and leaves. Pokaka, kaikomako and milk trees provide examples of this behaviour. Among shrubs of more conventional form, with leaves two to five inches long and twigs that are thicker and straighter, there are *Coprosma lucida,* which has tiny pits on the undersides of its glossy leaves where the lateral veins leave the mid-ribs and the pepper tree (*Pseudowintera colorata*), named for its hot-tasting, coloured leaves.

Ferns make the greatest contribution to the distinctive character of Westland forest. Tree ferns are everywhere in the hill forests. On the forest floor, crown fern forms knee-deep undergrowth. There are climbing ferns, and ferns perched on the limbs of trees. Filmy ferns cling to tree trunks, and their delicate, intricate fronds, become black and shrivelled in dry weather. The easily-recognised kidney fern is related to the filmy ferns, and likewise clothes tree trunks. Where the forest floor is dark and damp, one finds the feathery fronds of crepe fern (or Prince of Wales feathers), perhaps the most beautiful of all.

Climbers are abundant, and include the prickly bush-lawyer, supplejack with black, cane-like stems, and three kinds of rata vine. One of the latter produces showy red flowers all through the winter. At low elevations, especially near the sea, kiekie, recognisable by its thick stems and tufts of long, drooping, grass-like leaves, runs riot over trees and in the undergrowth. Another characteristic plant of warm lowland forest is puka, seen as masses of yellow-green leaves perched high in the crowns of the largest trees. Puka is not a parasite, but a small tree that merely perches on another tree to gain a place in the sun. There are also several orchids growing on trees.

Mosses and liverworts are small, humble members of the plant kingdom, but they merit attention for their abundance

Southern Rata *(Metrosideros umbellata).*

and fascinating variety of forms. Some are pendulous from branches, some live on trunks, some form soft cushions on the forest floor, and yet others make delicate, green carpets on steep banks. One that rejoices in the name *Dendroligotrichum dendroides* is a relative giant among mosses, with stems three-six inches tall, and there is the even-larger species, *Dawsonia superba,* perhaps the largest of all mosses. Fungi (moulds, toadstools and their relatives) are also an integral part of the forest and some have large or brightly-coloured spore-producing structures. Finally, there are lichens, which are dual organisms composed of fungi and microscopic algae. Lichens are independent of other plants for their food, although most of the forest species live attached to trunks or twigs.

The forests on the river flats are different from the hill forests. Totara, a podocarp with very sharp, yellow-green needles, is the commonest tree on flats with light, stony soils.

Kamahi *(Weinmannia racemosa).*

On deep, moist, silty soils, there were formerly extensive stands of two magnificent podocarps, kahikatea and matai. The former is the tallest New Zealand tree, sometimes exceeding 200 feet; its grey-green foliage is composed of slender twigs clothed with tiny scales, like those of a cypress. Note the buttressing roots around the bases of large trees.

Matai is not as tall but often has impressive girth. It bears short, spreading, blunt needles, and can be readily identified by the round " hammer marks " on its grey bark. Most forest of kahikatea and matai has been felled and replaced by rich farmland, but a good example is preserved near the Macdonald Creek Bridge. Kahikatea dominates on very wet areas to form true swamp forest, such as that at the north-eastern end of Lake Wahapo. The main plant beneath the kahikatea here is " bush flax " with fluted, tapering leaves about three inches wide and three feet long. Between the swamp forest and the open water, there is a fringing belt of fibre-yielding " New Zealand flax " or *Phormium tenax.*

Between the mountains and the sea there are extensive plateaux, lying at 1,000-2,000 feet. These are ancient river terraces and glacial moraines, and the soils have lost their

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The following captions are in order of their appearance in the book.

Southern Rata (*Metrosideros umbellata*). —*By courtesy J. H. Taylor.*

New Zealand Pigeon. —*M. F. Soper.*

On the Franz Josef Glacier. —*National Publicity Studios.*

At Lake Mapourika. —*Neville Hatwell.*

Hen and Chicken Fern (*Asplenium bulbiferum*).—*By courtesy J. H. Taylor.*

Mosses, lichens and algae clothe rocks of a recent moraine. —*By courtesy Gladys M. Goodall.*

On the road to Gillespies Beach. —*Neville Hatwell.*

Lake Mapourika and the Southern Alps from the air. —*Neville Hatwell.*

Gillespies Beach and the Southern Alps from the air. —*Neville Hatwell.*

Lake Matheson with reflections of Mt. Tasman and Mt. Cook. —*Neville Hatwell.*


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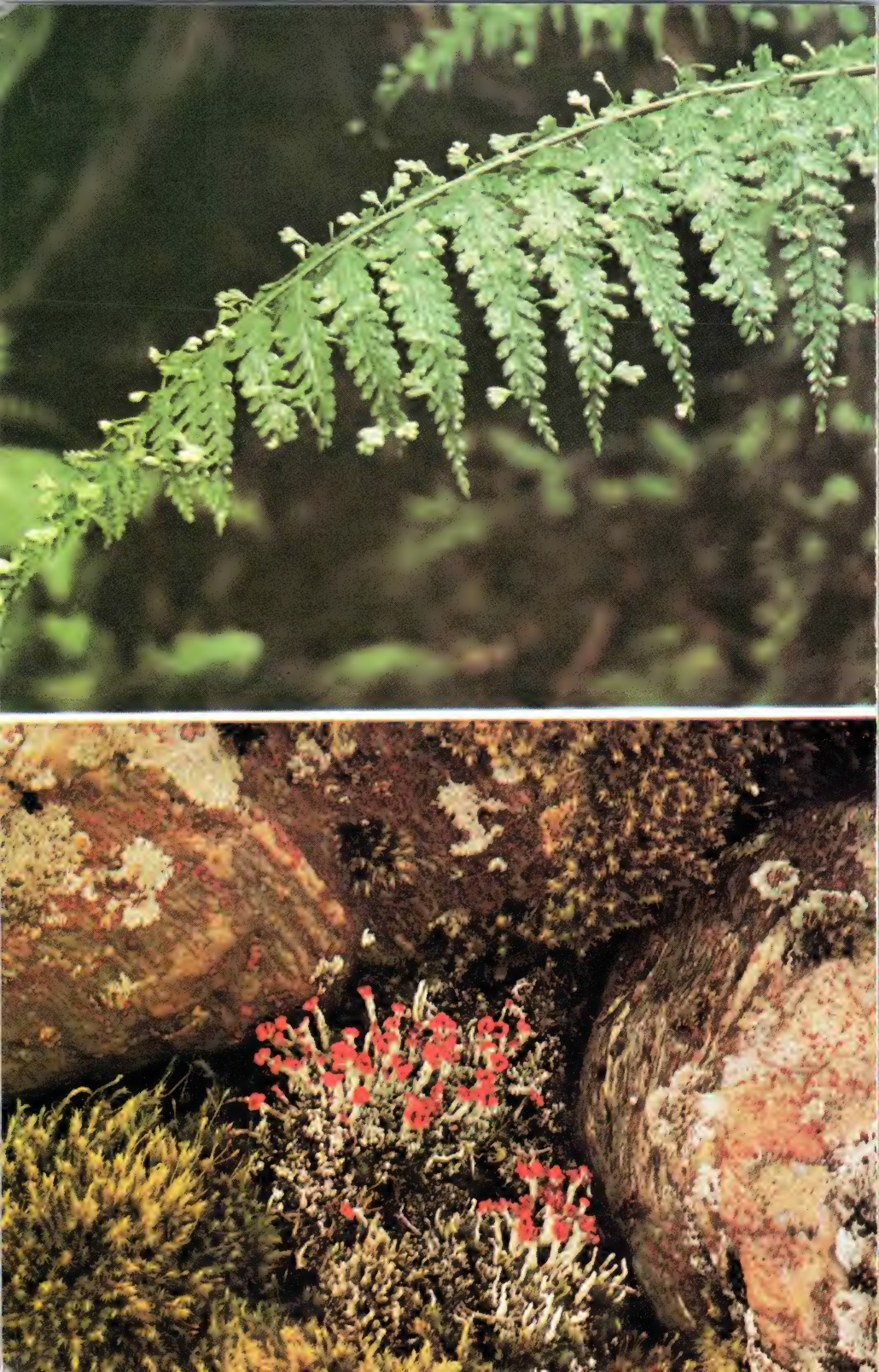


High-altitude Forest. From left: Toii *(Cordyline indivisa)*, Kaikawaka *(Libocedrus bidwillii)*, Pineapple tree *(Dracophyllum traversii)*.

fertility through the leaching effect of rain over thousands of years. The poorest areas support scrub of manuka, pink pine (which can be seen on the Omoeroa Saddle), silver pine and yellow-silver pine. These so-called pines, which are really small podocarps, bear cypress-like foliage and are difficult to tell apart. More fertile sites bear respectable forest of rimu and silver pine, with an undergrowth composed largely of celery pine, aptly named for its yellowish, flattened, leaf-like branchlets. On the forest floor, instead of ferns, there is a thick, springy carpet of mosses. Such forest can be seen on the highest part of the road to Gillespies Beach.

At Gillespies Beach, wind-shorn forest comes almost to the sand, being separated only by a dense belt of flax; gorse also is extensive where the native vegetation has been destroyed. On the steep headland, one finds some truly coastal plants, notably the shore koromiko, a shrub with leaves arranged in the form of a cross.

Westland National Park is unique in that it extends from the sea to over 11,000 feet. The visitor who wishes to learn how the vegetation changes with increasing altitude is urged to spend a day making the easy ascent to Alex Knob (4,288

feet). In climbing, it will be noticed that the lowland plants are left behind one by one. By 1,200 feet the last entanglements of supplejack have been passed, then rimu, miro, tree ferns and quintinia fall out in turn. Around 3,000 feet, there are the last kamahi, totara, wineberry, fuchsia and pate; rata extends just a little higher. At this level kaikawaka, easily recognised by its stout, tapering trunk and stringy bark, puts in a brief appearance. Despite the English name "cedar" and its botanical name *Libocedrus bidwillii,* this tree is a true cypress. Kaikawaka also grows where the main road crosses the Omoeroa River, a spot that is subject to frosts and valley mists.

The uppermost kaikawaka and rata mark the cessation of forests and the beginning of the dense vegetation of shrubs and small crooked trees that is known as subalpine scrub. Many of the scrub plants belong to the daisy family. The

Kahikatea Forest *(Podocarpus dacrydioides).*

commonest is the leatherwood or tupari (*Olearia colensoi*), a shrub with pointed oval leaves that are furry beneath and finely notched. Another *Olearia* is aptly named mountain holly, while a third, *Olearia lacunosa,* has very narrow stiff leaves. The inaka or grass tree is the most abundant of the dracophyllums, and can be recognised by the tufts of grassy leaves on the ends of its otherwise rather naked twigs. Higher up, this shrub is replaced by a smaller, more compact relative known as turpentine shrub, because its twigs will burn while still green. A very much larger member of the same group, *Dracophyllum traversii,* may be identified by its local name of " pineapple tree." The small tree in the gullies is mountain ribbonwood. Its soft, deciduous leaves and masses of white flowers that recall cherry blossom seem out of place in the ever-green subalpine scrub.

Although patches of low scrub ascend to the summit of Alex Knob on steep slopes that face north, grassy vegetation becomes predominant above about 3,800 feet. The coarse-leaved snow-grasses cover most of the ground, and provide the setting for a considerable variety of mountain flowers. *Celmisia armstrongii,* which has narrow tufted leaves with yellow midribs, is the commonest of the mountain daisies, but the finest is *Celmisia coriacea,* which has broad, silvery leaves a foot or more long and flower heads three inches across. Tight, silvery cushions of *Celmisia sessiliflor*a will also be seen. In hollows, or in the shelter of scrub, there are patches of *Ourisia macrocarpa,* with large shining leaves and showy clusters of flowers that, like most flowers of the New Zealand mountains, are white. A little koromiko, *Hebe macrantha,* is a choice dwarf shrub with small, fleshy, notched leaves and disproportionately-large flowers. There are also white-flowered gentians, sharp-leaved " speargrasses," a tiny marsh marigold, and a prostrate coprosma with bright-orange berries.

There are more than 500 species of seed-plants and ferns in the Park. Strikingly absent, however, are the evergreen New Zealand beeches that are such a predominant feature of the forest throughout Fiordland and at Arthur's Pass. There is a small patch of silver beech, just within the Park Boundary, in the upper reaches of the Karangarua River, but otherwise the nearest beech forests are 50 miles to the south. This absence is usually attributed to the great glacial periods, when ice literally swept the forest from Westland.

When warmer conditions returned, the majority of species were able to return because they have seeds that are readily dispersed by birds or wind, but the beeches spread more slowly. When one stands on the open river flats and views the great icefields that even today are poised above the forest sending down probing glaciers, this theory seems plausible.

Since 1900 the Franz Josef and Fox Glaciers have been showing further, though fluctuating, retreat. This has exposed bare rock walls and gravel valley floors for colonisation by plants, and by following the tracks and roads leading from the glaciers, processes which must have occurred when the ice ages ended can be seen in action today. During the first few years, only occasional tufts of willow herb and grass and soft mats of *Raoulia tenuicaulis* occur. Thereafter, however, native broom and dark green shrubs of tutu appear. These two plants, in co-operation with certain bacteria that inhabit their roots, extract nitrogen from the air and release it to the soil in the form of nutrients available to other plants, and set the stage for a rapid increase in the density and variety of vegetation. Among the first to take advantage of the increased fertility is mountain akeake, a tall shrub with greyish foliage. It is followed by wineberry, pate, broadleaf, rata, kamahi and, after a very long time, by podocarps such as rimu and totara. The succession is but one example, albeit a very striking one, of the continual changes that take place in natural vegetation. Another example, that one records regretfully, is the destruction caused by introduced mammals. Dead rata and kamahi on the mid-slopes of the mountains speak all too eloquently of browsing by Australian opossums. Chamois and thar are most numerous in the least accessible parts of the Park, and carry their depredations to the upper limits of vegetation. While the sporting value of these animals is recognised, policy in the National Parks aims at their complete extermination, for the preservation of the unique New Zealand fauna and flora is the primary purpose of these magnificent reserves.

COMMON NAMES AND THEIR LATIN EQUIVALENTS

Broom	*Carmichaelia grandiflora*
Broadleaf	*Griselinia littoralis*
Bush Flax	*Astelia nervosa*
Bush-lawyer	*Rubus*
Celery Pine	*Phyllocladus alpinus*

Crepe Fern	*Todea superba*
Crown Fern	*Blechnum discolor*
Filmy Ferns	*Hymenophyllum* and *Trichomanes*
Five Finger	*Neopanax colensoi*
Fuchsia	*Fuchsia excorticata*
Gentians	*Gentiana*
Inaka (Grass Tree)	*Dracophyllum longifolium*
Ivy Trees	*Neopanax* and *Pseudopanax*
Kahikatea	*Podocarpus dacrydioides*
Kaikomako	*Pennantia corymbosa*
Kaikawaka ("cedar")	*Libocedrus bidwillii*
Kamahi	*Weinmannia racemosa*
Kidney Fern	*Cardiomanes reniforme*
Kiekie	*Freycinetia banksii*
Kohuhu	*Pittosporum colensoi*
Lancewood	*Pseudopanax crassifolium*
Leatherwood (tupari)	*Olearia colensoi*
Lemonwood	*Pittosporum eugenioides* (absent from southern Westland)
Manuka	*Leptospermum scoparium*
Matai	*Podocarpus spicatus*
Marsh Marigold	*Caltha novae-zelandiae*
Milk Tree	*Paratrophis microphylla*
Miro	*Podocarpus ferrugineus*
Mountain Akeake	*Olearia avicenniaefolia*
Mountain Daisy	*Celmisia*
Mountain Holly	*Olearia ilicifolia*
Mountain Ribbonwood	*Hoheria glabrata*
Myrtle	*Neomyrtus pedunculata*
New Zealand Flax	*Phormium tenax*
Pate	*Schefflera digitata*
Pepper Tree	*Pseudowintera colorata*
Pink Pine	*Dacrydium biforme*
Pokaka	*Elaeocarpus hookerianus*
Prostrate coprosma	*Coprosma cheesemanii*
Puka	*Griselinia lucida*
Quintinia	*Quintinia acutifolia*
Rata (tree)	*Metrosideros umbellata*
Rata (red-flowered vine)	*Metrosideros fulgens*
Rimu	*Dacrydium cupressinum*
Shore Koromiko	*Hebe elliptica*
Silver Beech	*Nothofagus menziesii*
Silver Pine	*Dacrydium colensoi*
Snow-grass	*Chionochloa*
Speargrass	*Aciphylla*
Supplejack	*Rhipogonum scandens*
Totara (on river flats)	*Podocarpus acutifolius*
Totara (elsewhere)	*Podocarpus hallii*
Tree ferns	*Cyathea* and *Dicksonia*
Turpentine shrub	*Dracophyllum uniflorum*
Tutu	*Coriaria arborea*
Weeping Matipo	*Myrsine divaricata*
Willow-herb	*Epilobium*
Wineberry	*Aristotelia serrata*
Yellow-silver pine	*Dacrydium intermedium*

BIRDS

FROM " Mr Explorer Douglas " (p. 174) we can obtain a pen picture of bird life nearly one hundred years ago— " . . . The Weka prowled round the Tent, anexing anything portable and the Kiwi made night hedious with its piercing shriek. The Blue Duck crossed over to whistle a welcome. The Caw Caw swore and the Kea skirled, Piegeons, Tuis, Saddlebacks and Thrushes hopped about unmolested. The chorus of the Bell bird was heard in the dawning and all were tame and inquisitive, but now all this is altered. (Approximately 1890.) The Digger with his Dogs, Cats, Rats, Ferrets and Guns have nearly exterminated the Birds in the lower reaches of the southern rivers . . . Before we left the Copland and coming away we saw the Tracks of a Cat. Such is the result of the advent of the white man a few months more and pussy will extend operations and the small birds will vanish for ever an worse and worse the Ferret is on his way up from south . . ."

Unfortunately Mr Explorer Douglas was correct in his forecast that some birds would vanish for ever and we are no longer able to see such birds as the South Island saddleback and thrushes, and other birds are not so plentiful as they were. However, many species of birds are still to be found in the Park area and with full protection of their various habitats should remain a source of enjoyment to visitors.

It is not intended to give detailed descriptions of birds here as suitable books are available; nor is it intended to give an exhaustive list of all birds to be found. Rather, an attempt will be made to give an indication of the kinds of birds to be found in various habitats, and those likely to be encountered in areas used by visitors. Even so, no hard-and-fast rules can be laid down. Birds will appear in different parts in accordance with the weather conditions and food supply available

at various times of the year, and according to preferred nesting places. Migratory birds such as the cuckoos will be heard only from September until early autumn.

HABITATS

Lakes: Black teal, southern crested grebe, dabchick (Lake Wombat), grey duck, paradise duck, shoveller (not seen often), kingfisher, white-throated shag, black shag, white heron, white-faced heron and the introduced mallard duck, black swan. Canada goose is seen rarely—not established.

Swamps: Pukeko, bittern, harrier hawk.

Pakihi: South Island fernbird.

Riverbeds and flats: Blue duck (from higher to lower levels), South Island pied oystercatcher, banded dotterel, pipit, black-backed gull, paradise duck.

Bush: Morepork, falcon (bush hawk), South Island kaka, parrakeet, tui, bellbird, yellow-breasted tit, grey warbler, brown creeper, white-eye (silver-eye, wax-eye, blight bird), South Island fantail, South Island rifleman, South Island robin, shining cuckoo, long-tailed cuckoo.

Above bush: Rock wren, pipit, kea. (The keas will often come down to the township areas.)

Beaches, coastal lagoons, estuaries: Spotted shag, black shag, white-throated shag, Caspian tern, white-fronted tern, black-backed gull, black-billed gull, red-billed gull, South Island pied oystercatcher, black oystercatcher, pied stilt, banded dotterel, eastern bar-tailed godwit, white heron, white-faced heron, royal spoonbill, pukeko, kingfisher, southern blue penguin, crested penguin, pipit.

Seen generally: Chaffinch, yellowhammer, lesser redpoll, goldfinch, hedge sparrow, blackbird, song thrush, skylark, black-backed gull, starling, and—near habitations—house sparrow. (All of these except the gull are introduced birds.)

SPECIFIC BIRDS

Western Weka: This bird, so common many years ago, is still reported to be in the Copland Valley from the Welcome Flat area to above the Douglas Rock Hut; in the Fox River valley near the picnic spot under Cone Rock and up the

slope of Mount Fox over the 2,000 foot mark in alpine scrub; along the coast south of the Waikukupa River; and along the coast at Okarito.

Kiwi: This bird has been reported as heard near the Franz Josef Glacier township on the mountain slopes in the direction of the Tatare Stream power station. It is probably widespread but being nocturnal is rarely observed or heard. (Possibly both the South Island kiwi—tokoeka, and the Large Grey Kiwi—roa, are present.)

South Island Robin: The distribution of this bird in the Park is not known but visitors may possibly see or hear it most readily at Franz Josef Glacier in the Douglas Track-Peters Pool-Waiho suspension footbridge area. It does not appear to be very plentiful.

New Zealand Pigeon: Although primarily a bush bird the pigeon is common throughout and is often seen on the farm lands by the main road north of the Franz Josef Glacier township, and by the road to the Gillespies Beach. Pigeons may even sit around in small flocks in the paddocks.

OKARITO WHITE HERON COLONY

The only known nesting place for these birds in New Zealand is north of the Okarito Lagoon outside the Park boundary. In the breeding season, white herons and royal spoonbills congregate from all parts of New Zealand, and together with white-throated shags form a nesting colony. Perhaps, some day, they will be joined by the little egrets (a much smaller white heron) a few of which are scattered throughout New Zealand. This area is naturally under strict protection and a special permit and special arrangements are required to visit it.

EASY TRIPS FOR BIRDWATCHING

FRANZ JOSEF GLACIER AREA.

Glacier Road—Lake Wombat track: Tui, bellbird, grey warbler, fantail, brown creeper, yellow-breasted tit, New Zealand pigeon, and perhaps the rifleman and kaka.

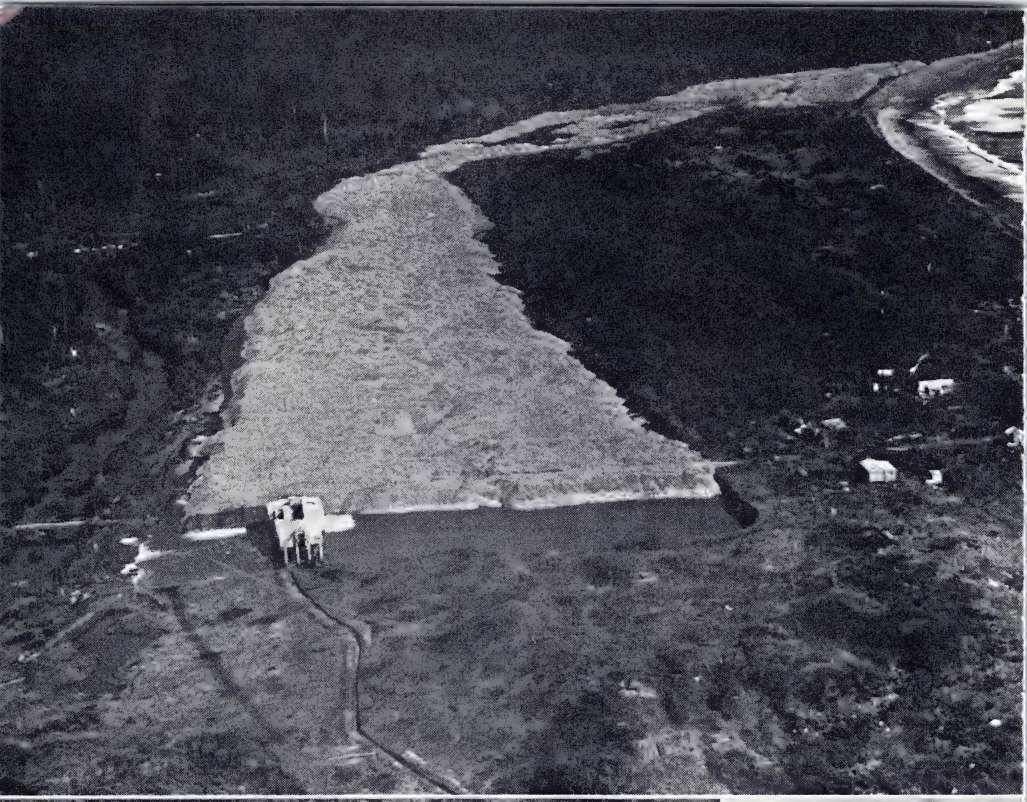
On the lake: Grey duck and, if lucky, dabchick.

Glacier Road car park area: Falcon sometimes to be seen.

Douglas track—Peter's Pool—Waiho suspension bridge: Tui, bellbird, grey warbler, fantail, yellow-breasted tit, New

Stoat. —*N.Z. Forest Service, J. H. Johns, A.R.P.S.*

Thar. —*N.Z. Forest Service,*



Dredging for gold, Gillespies Beach, 1930–1945.
—*Whites Aviation.*

Sluicing for gold, Waiho, 1895–1905.

Modern method of black sanding, Gillespies Beach. —*R. Warburton.*

Zealand pigeon, and if in luck, South Island robin. Falcon sometimes near the bridge.

Lake Mapourika (picnic spot and along fringes of road skirting the lake): Crested grebe, black teal, grey duck, mallard duck, black swan, white-throated shag, white-faced heron, kingfisher, New Zealand pigeon, tui, bellbird, yellow-breasted tit, grey warbler, brown creeper, white-eye.

Pakihi on left of road to Okarito Beach: South Island fernbird, South Island robin.

Okarito Beach, Lagoon and Estuary: See information above on beaches, coastal lagoons and estuaries.

Fox Glacier Area.

Lake Matheson walk: Grey warbler, fantail, yellow-breasted tit, brown creeper, bellbird, tui, New Zealand pigeon, pukeko, grey duck, mallard duck, white-faced heron, harrier hawk, and perhaps South Island kaka.

Lake Gault walk: This walk is more difficult, but there is a good chance of encountering the South Island kaka well up the hill. The rifleman has also been reported. Other birds are much the same as on the nearby Lake Matheson walk. There are crested grebe on Lake Gault, but they may be too far away to see. They are easier to see on Lake Mapourika or Lake Wahapo from the road.

Cook River flat (roadside paddocks): This area abounds with introduced birds such as redpoll and yellowhammer. However, in season, perhaps the most enjoyable aspect for those who stop to listen is the singing of the numerous introduced skylarks.

Cone Rock: Falcon (bush hawk) reported to nest in this area.

ROADSIDE LISTENING

For those who are unable to spend much time in the area, roadside stops in the bush area between the Fox Glacier and Franz Josef Glacier townships are particularly rewarding; bellbirds, tuis, New Zealand pigeons, fantails, grey warblers and yellow-breasted tits may be both seen and heard, and in the spring and summer the calls of the shining and longtailed cuckoos add to the variety of song. From the road by Lakes Mapourika and Wahapo the crested grebe in particular may be seen readily.

Toe Toe House, about 1900, where Mr and Mrs Batson provided the first public accommodation at Waiho.

INSECTS OF WESTLAND

WESTLAND offers a variety of diverse habitats for insect life, ranging from luxuriant lowland forest with its sheltered clearings, to subalpine beech forest and exposed mountain grasslands. Each habitat contains a characteristic array of insects, but these have not been well studied and no doubt many interesting discoveries await the keen investigator.

The visitor to Westland will very soon find himself host to one of the commonest insects, the sandfly. This small biting fly can cause considerable irritation when large numbers are seeking their blood meals. The larvae live in the swift-flowing streams which abound in this area of high rainfall. These swift streams flowing through bush and open country are worthy of a closer investigation for they contain the larvae of Mayflies, Stoneflies, Alderflies and Caddisflies. The brown-and-green larvae of the stonefly, *Stenoperla prasina,* reach two inches in length and are carnivorous, preying mainly on smaller mayfly larvae. The adult stonefly is bright green and may be met with near water. In the quiet water of ponds or tarns, sluggish nymphs of Dragonflies occur. The mature dragonflies are common in lowland areas near water and may include delicate Damselflies, *Austrolestes colensonis* (blue or green) and *Xanthocnemis zealandica* (red), the moderate-sized *Procordulia smithii,* and the largest of New Zealand dragonflies, *Uropetala carovei,* with a wing spread of four and a half inches.

The wide expanses of shingle in the riverbeds are the habitat of many sun-loving beetles. The tiger beetles, *Cicindela tuberculata and C. helmsi* occur here, as do certain smaller *Bembidium* and *Scopodes* beetles, the latter including some brilliantly metallic insects. These small beetles run rapidly over the stones in hot sunshine. On all shingle areas, the irides-

cent, purple Boulder Butterfly, *Chrysophanus bouldenarum,* is extremely abundant in the summer.

If we enter the luxuriant rain-forest we might come across the beautiful brown lacewing, *Stenosmylus incisus,* or its rare relative *S. latiusculus.* On the forest floor, daddy-long-legs can often be seen flitting clumsily about, and the bush weta, *Gymnoplectron,* a large velvety-brown insect with long hind-legs for hopping, may occasionally be observed. The common wetas, *Hemideina,* with shorter legs and powerful jaws, occur in holes in trees or under logs. Also under logs, various kinds of the characteristic New Zealand ground beetles, *Mecodema,* may be located. These handsome black beetles have strong jaws and can bite if not handled carefully. The stag beetle, *Lissotes helmsi,* which reaches two inches in length, has been found under bark at the base of kahikatea trees. Comical stick insects occur in the forest and around forest margins.

Scrub or tussock clearings in the forest provide sheltered sunny sites for many insects. Here the red-admiral butterfly, *Vanessa gonerilla,* and the copper butterfly, *Chrysophanus salustius,* can be seen on warm days. Clearings in beech forest are the habitat of the elusive butterfly, *Dodonidia helmsi,* which is found only in late January or early February. The green chafer beetle, *Chlorochiton suturalis,* can be abundant in grassy areas where it rises from the ground at dusk to fly clumsily about. Once, when camping in a grassy clearing, I found the tent suddenly crowded with these beetles that had been hidden in the grass during the day. Various cicadas can be heard singing in open areas or forest clearings when the sunshine is warm. The sound, emitted only by the male, is made by vibrating a pair of drum-like membranes situated on the underside of the body. A different sound is characteristic of each species.

Many insects can be found at night. A walk along a wet bush path at night may be rewarded by seeing the New Zealand glow-worm. It is best looked for on overhanging, fern-covered banks or under the crowns of tree-ferns. The light is produced by the larva of a gnat, *Arachnocampa luminosa,* and is used to attract small insects on which it feeds. The prey is caught on a curtain of sticky silken threads. A lighted room will attract many species of insects, particularly if the night is warm and rather misty. Among the most beautiful of the moths that are attracted to light, is the South Island Lichen

Moth, *Declana egregia,* with its brown-and-white mottled pattern closely resembling various sorts of lichen.

Above 4,000 feet, the alpine insect fauna of Westland is typical of the Southern Alps as a whole. In sheltered regions formed by hanging valleys the black-and-yellow Tiger Moth, *Metacrias erichrysa* is found. The male of this species flies rapidly in hot sunshine, but the female, a soft, whitish, wingless creature, remains hidden in a silken cocoon under stones. In similar habitats, *Declana glacialis* and *Ichneutica ceraunias* are two large and rather striking moths that fly during the day. In the high alpine tussock, large brightly-coloured grasshoppers are common when the sun is shining. The shrill songs of alpine cicadas, *Melampsalta oromelana, M. nigra* and *M. cassiope,* may be heard, especially on shingle screes. The jet-black, high-altitude butterfly, *Erebia merula,* occurs on these scree slopes and is very difficult to catch. On tussock slopes the smaller, brown, mountain butterfly, *E. butleri,* may be seen. The life history of these two butterflies is still unknown. Alpine flowers abound in summer, providing a favourite feeding site for some rather soft elongate *Dasytes* beetles of a bluish iridescent colour. A rare and striking find in the high alpine zone is the large, black-and-white striped weevil, *Lyperobius hudsoni.*

A visitor to Westland should keep a sharp lookout for rare migrant butterflies from Australia, particularly late in the summer. These migrants are recorded from time to time along the western coast of New Zealand, but few have so far been reported from sparsely-populated Westland. Most spectacular is the Blue Moon butterfly, *Hypolimnas bolina,* a large black insect with white patches on each wing. It is about four inches across. Other species that might be seen include the Lesser Wanderer, *Danaus chrysippus;* the Meadow Argus, *Precis vellida*; and the Blue Tiger, *Danaus hamata.*

THE SEALS OF GILLESPIES BEACH

AFTER a walk of an hour along the beach from the end of the road, the visitor may be lucky enough to see the colony of seals. The species found here is the commonest seal found on the New Zealand coast and is known as Forster's Fur Seal (*Arctocephalus forsteri*). Victims of ruthless destruction in the past, these interesting animals are now strictly protected, and under protection they have increased to such an extent that dozens may be seen in a single colony.

Although they appear clumsy on land, seals are extremely efficient as far as locomotion in water is concerned; movement there is fast and graceful. Seals must return to land to moult and to have their young. In the early summer the males select the breeding ground and establish a "harem". Usually only one "pup" is produced at a birth; it grows rapidly and is weaned when a few weeks old. In the autumn and winter, the seals return to land to moult and it is then that we find single animals on the shore or sheltering among large rocks.

INTRODUCED ANIMALS

Chamois (*Rupicapra rupicapra*).

SIR Julius von Haast made the first enquiries regarding importation of chamois in 1888, but it was not until 1907, when eight chamois (two males and six females, two of which were pregnant) were liberated in the Mount Cook area. This followed negotiations by the Department of Tourist and Health Resorts with an Austrian warship captain, who secured the animals which were later released in New Zealand. In 1914 two more chamois were released in the same area.

G. M. Thomson in 1922 reported that by 1920 "herds of 30, 40 and 70 (were) being noticed at one time," so that it was probably shortly after this that chamois began to appear in what is now Westland National Park. In 1930 protection of the animals was removed; by 1934 Yerex reported herds to be widespread, and two years later culling operations were begun. In 1939 herds of 20 and 30 were encountered in the Callery and Tatare Rivers.

Today chamois may be seen throughout the mountainous areas of the Park with chances of a fine trophy for those prepared to climb.

Thar (*Hermitragus jemlaicus*).

Two liberations of thar were made in the Mount Cook area, the first in 1904 of two males and three females and the second in 1909 of eight animals. Both liberations were made under the auspices of the New Zealand Government with animals imported from the Himalayas.

The animals apparently throve in their new habitat but did not disperse from their point of liberation as quickly as did the chamois and today they are not as widespread. They are to be

encountered in the Park along the main divide and in the steeper rather inaccessible parts of the subsidiary ranges.

Red Deer (*Cervus elaphus*).

In 1871, eight red deer were liberated in the Morven Hills, Lake Hawea, by the Otago Acclimatisation Society. These were the nucleus of the South Westland deer populations, spreading to the Park via the Hunter, Landsborough and Karangarua Rivers. It is possible that private liberations, not recorded, may have accelerated the early spread.

Today the highest populations of deer in the Park occur in the southern portion from the Karangarua River to the Cook River, with lesser numbers between the main highway and the sea. The inaccessible nature of the portion between the Cook River and the Whataroa River has slowed the spread of deer to this area.

Opossum (*Trichosurus vulpecula*).

Opossums from Australia were first introduced into New Zealand about 1840. Further introductions followed until 1924, but most liberations, both before and after this date, were made from New Zealand-bred opossums.

Several liberations of opossums were made between 1920 and 1930 in, or near to, the present Westland National Park; amongst those recorded being at Lake Mapourika, Cook River and the Fox Saddle.

Opossums are now widely dispersed and the occupation of any remaining suitable habitat is expected to occur within the next decade.

Stoat (*Mustela erminea*), Weasel (*M. nivalis*) and Ferret (*M. putorius*).

These all occur in the Park, but the stoat is the only one normally seen. This is usually the species of Mustelid observed feeding on dead opossums on the main road. As stoats can readily climb trees and are known to include birds in their diet, they must be looked on as enemies of the native fauna.

Goat (*Capra* sp.).

The few goats present in Westland National Park have reverted to a feral state from domestic stock originally kept for food and milk or to control noxious weeds. These animals are almost entirely confined to the dense bush area between the main road and the sea.

A greater part of the sub-alpine forest and alpine tussock grasslands and fell-fields within the Park is now occupied by both thar and chamois, with consequent modification of the vegetation occurring.

Red deer and opossums are present in local distributions, but much suitable habitat remains which is as yet uncolonised. From observations elsewhere in Westland, goats are unlikely to be of more than local significance.

It has been noted that the pattern of damage to the rata-kamahi forest elsewhere has been most severe where both deer and opossums have reached high numbers in combination. It is also suspected that similar interactions may occur with other animal combinations within a habitat, and damage is seldom directly attributable to any one animal species in such cases.

Control of noxious animals within the Park poses many problems. Much of the country on which these animals will thrive is rugged, inaccessible and heavily forested, and has a difficult climate. While private hunting and trapping on the more accessible country and fringes make a valuable contribution, the use of aerial poisoning offers the most promise for the control of these animals in the future.

Aerial poisoning has been used with success against both deer and opossums in Westland, and trials are at present being undertaken outside the Park to investigate the use of poisons for the control of thar and chamois.

NOXIOUS ANIMAL CONTROL

The shooting of deer, chamois and thar within the Park is encouraged and provides excellent sport.

Infested areas are divided into blocks, the boundaries usually being the top of mountain ranges. Blocks 1 and 2 are the lower and upper reaches of the Copland Valley respectively, 3 the Regina Valley, 4 the Douglas, 5 the headwaters of the Karangarua River; Blocks 6 and 7 lie in the Cook Valley, Block 8 is the Victoria Range and Block 9 the Fox Range.

First Pioneer Bivvy, 1934. Miss Kate Gardiner cuts the ribbon. Others from left: Frank Alack and Bert Cowan (builders) and Harry Ayres.

New Pioneer Hut under construction on Alack Ridge, November 1965. —*Neil Hamilton.*

Part of Franz Josef Glacier and névé. Mt. Elie de Beaumont, 10,200′; Mt. Walter, 9,507′; Mt. Green, 9,305′. —*Whites Aviation.*

Whymper Face of Elie de Beaumont, 10,200′. —*Mannering and Donaldson.*

Blocks 6, 7 8 and 9 support considerable populations of chamois, with some deer in Blocks 6 and 7. Blocks 6, 8 and 9 are suitable for short-term permits, say one to three or four days. In the other five blocks deer, chamois and thar may be found, Blocks 3, 4 and 5 carrying large populations of all three species.

Persons wishing to shoot noxious animals in the Park must apply for a permit which, if granted, will allow them to hunt for a defined period in a given area. Applications should be addressed to: The Ranger, Westland National Park, Fox Glacier.

A bounty in the form of .303 ammunition is offered in exchange for tails returned. Only high-velocity rifles may be used and under no circumstances are dogs allowed in the Park.

The destruction of opossums is also desired and permits to destroy these animals are obtainable from Park headquarters at Franz Josef Glacier or the sub-headquarters at Fox Glacier.

Descending north ridge of Glacier Peak. —*Neil Hamilton.*

GOLD

GOLD and Westland National Park are quite inseparable, for it was the discovery of rich deposits which brought thousands of prospectors to many parts of Westland. It was these adventurous men of many creeds and nationalities who first settled the wild inaccessible and remote areas within the Park. Today Crown Law preserves these scenic beauty spots for man's enjoyment and yet less than a century ago they were governed by nothing more than a Miner's Right.

Gold mined in the Park was alluvial and the main carrying streams were Macdonalds Creek and the Callery, Waikukupa and Cook Rivers. The gold was carried down these rivers to the iron sands of the beaches, which are constantly washed by the roaring Tasman rollers and whence fine views are obtained of the majestic Southern Alps and the Franz and Fox Glaciers. So it was amidst this grandeur that the first prospectors commenced working their beach claims. They were to find, however, that they could only make from £6 to £8 per week and this did not satisfy the more adventurous.

The Macdonalds were no exception and they moved inland from their claim at Five Mile Beach to what is now known as Macdonalds Creek. Their enterprise was rewarded by finding in isolated pockets a pound weight of gold per yard of gravel; however, these discreet Irishmen never disclosed the extent of their fortune, but very quietly disappeared with it, presumably to the Emerald Isles!

An hotel was built and in the next few years various prospectors worked the area. Two of the greatest renown were Billy McHugh and Hong the Chinaman, the latter complete with pigtail. These two had a magnificent spree together at the Forks Hotel which culminated in an unusual disaster and forced Billy McHugh to hide in the bush for a week. Now sober and fearful at the thought of his practical joke, he lived in

terror of a face-to-face encounter with the outraged Hong, now minus his pigtail!

The first gold in the Franz Josef area was discovered by a man named Callery. Later came such well-remembered men as German Harry, Piggery Charlie, Wombat Jack, and many others. Here again good pockets of gold were taken, with the best coming from underneath the Waiho Bridge. The Graham Brothers and Jim Green dammed alternate sides of the river and so worked the complete bed, the reward being 12 pounds of gold for a winter's work with prices at the time being £3 16s per ounce.

Gold from the Waikukupa had its main source in Cement Hill, so named because of the concrete-like nature of the black sand. To break this down, heat was needed and the sand was crumbled with fires of rata logs.

Gillespies Beach provided work and hopes for hundreds of prospectors and a number of South Westland families were reared there. Even to the present day it provides sufficient gold for beachcombing and the miner can still be seen working the black sand.

The first commercial scheme was undertaken by a British firm who called themselves "The Waiho Sluicing Company" and commenced operations at the turn of the century in the Tatare Gorge. In those days the area was completely inaccessible with the road ending at Macdonalds Creek. Their materials, including steel for pipes, were landed at Port Okarito and carted by horse and dray to Macdonalds Creek; then punted across Lake Mapourika and once again carted by horse and dray to Waiho. The pipes were mainly two feet six inches in diameter, though some were three feet and these were all hand riveted on arrival. They were then snigged into position by horses, not an easy task in rugged country and thick bush. The major obstacle of the scheme was doubtless the driving of the Tatare tunnel through solid rock for a length of 1,500 feet. This task alone occupied a year, working three shifts per day. Overall there were about two miles of pipes, and signs of these early times can still be seen along the Callery Track. What is now known as the Terrace Track was once a sluicing area and the main claim was on the upper end of the present aerodrome. The finished scheme operated for several years with no very outstanding reward and the Company

finally closed in 1908. However, the tunnel has lived on as a memorial to these hardy men. Water still flows through it and for the past 25 to 30 years it has been used to generate a supply of electric power for local requirements.

Gold has gone from the Park and today not much more remains than the colourful history of its discovery, the hopes and endeavours of people who came seeking wealth in a new land. Today, descendants from families who first settled the beaches still remain, prosperous and rearing yet another generation to maintain names familiar in the area for over a century. They have found wealth of another nature in the land or scenery. Gold has been their stepping stone to more stable achievement.

THE MOUNTAINS

THE Westland National Park is dominated by the mountains. They tower, white and implacable, above the rich tangle of forest at their feet. No matter where you go in Westland, your eyes are drawn to the backdrop of the Alps, highest of all New Zealand's mountain groups.

From Elie de Beaumont in the north to Sefton in the south, millions of tons of snow gravitate westward to form the glaciers of Westland, the most famous being the Fox and Franz Josef Glaciers.

Wherever there are mountains, there will always come men and women who want to climb and conquer them. The latter part of the last century and the earlier part of the present gave great opportunities for pioneering.

The " Battle of the Tops " began early in the 1880s when overseas climbers turned their attention to the Alps of New Zealand. Notable alpine work had already been done by scientists and survey parties including Dr James Hector, C. E. Douglas, G. M. Mueller and G. J. Roberts.

Mount Cook naturally received the most attention. The Swiss climbers, Boss and Kaufmann, and the Irish parson, Green, reaching a point some 200 feet below the summit. But the first ascent was made by three New Zealanders, George Graham, Tom Fyfe and Jack Clarke, on 25 December 1894.

The Englishman, E. A. Fitzgerald, who had hoped to be the first to conquer Cook, turned his attention to other peaks, and in February 1895 with Zurbriggen, climbed Tasman and later Haidinger and Sefton. He also made a first east-west crossing of the Copland (Fitzgerald) Pass and Graham Saddle.

The turn of the century brought a renewed response to the challenge of the mountains, most of the local expeditions being led by Alex Graham, a legendary name in Westland mountaineering. To him and his companions, the Rev. H. E.

Newton and Dr E. Teichelmann, are credited at least six first ascents of the 10,000 " footers." Other honoured names are those of Tom Fyfe, Peter Graham (brother of Alex), Lowe, Frank Milne and Miss Freda du Faur. The Graham brothers spent most of their working lives as professional guides in the Alps and Frank Alack also guided for many years.

From 1910 to 1950, guided climbing was predominant, huts and bridges were built, tracks formed, and all potential climbers given encouragement.

Today the amateur clubs are the alpine history-makers, using modern equipment and ironmongery unknown half a century ago. More huts are being built in positions serviced by ski-planes able to land on the snow-fields above the glaciers.

In spite of these modern innovations, the challenge and the inspiration are still there and the mountains are still there, unchanged and unchangeable in all their beauty and grandeur.

MOUNTAINEERING TODAY

WITHIN the Park lie almost boundless opportunities for the intermediate and expert mountaineer, who, even today, will find unclimbed ridges and faces awaiting the ring of a hard-driven piton and the hiss of a primus stove from some small bivvy-tent high on an icy ledge. The occupants, watching a brilliant sunset over the Tasman Sea, will wonder whether tomorrow will bring cloudless skies and fulfilment of a long-cherished ambition or the dreaded north-west storm roaring in from that vast expanse of ocean, heralding failure and possibly a fight for existence during a descent through blizzard conditions.

Mountaineers in Westland must be prepared for rigorous conditions and prolonged periods of bad weather. They must be used to tight belts to stave off hunger when the long-awaited airdrop fails to arrive or the party is held up for days by swollen rivers.

Four is an ideal number for a party, allowing easy distribution of equipment plus the added safety factor should an accident occur.

The march in through the rugged gorges and rain forest can have much of the back-breaking work removed by having an airdrop of supplies at some predetermined spot, but the party must still carry enough emergency rations to prevent privation should the supply drop be lost.

From the northern cornerstone of the Park, Mt. Elie de Beaumont (10,200 feet), to Mt. Isabel (8,518 feet) in the south, lies a 30-mile chain of the main peaks of the Southern Alps while running west from these to the main highway are numerous subsidiary ridges which can provide hard, difficult climbing of a lesser altitude.

Unlike the adjoining Mount Cook National Park, there are few high-climbing huts. Altitudes given are only approximate.

*Almer Hut—12 bunks, altitude 5,000 ft, on the Almer Ridge on the route used for the Graham Saddle crossing.

*Chancellor Hut—12 bunks, altitude 4,000 ft, on a terrace under Chancellor Dome on the north side of the Fox Glacier.

*Pioneer Hut—15 bunks, altitude 8,500 ft, at the head of the Fox Névé close under the Main Divide.

Douglas Rock—14 bunks, altitude 3,000 ft, in the upper Copland Valley, six hours from the Copland Pass.

Welcome Flat—16 bunks, altitude 1,400 ft, situated in the Copland Valley, four hours from the West Coast highway.

All huts marked * are fully equipped with cooking facilities, primus stoves, fuel, mattresses and sleeping bags or blankets.

Radio transmitters in huts are for use by occupants at a scheduled time or in an emergency; Mount Cook National Park Headquarters can be called day or night. There is also a sealed emergency First Aid Kit in each hut.

MAIN DIVIDE

The finest trip in the Park, with a diversity of scenery unequalled anywhere in New Zealand, is the double crossing of the Main Divide via the Graham Saddle and Copland Pass.

Huts are available at all overnight stops, Almer, De La Beche, Hermitage, Hooker, Douglas Rock, Welcome Flat.

At the last, a bathe in the thermal pool is a " must " for all parties, be it rain or snow.

The beginning of the Copland Track can be seen from the Pass in clear weather, starting as a series of zig-zags and following the true left bank of the river to Douglas Rock Hut. It is three hours down to Welcome Flat, then another four hours by a good track to the highway.

All members must be equipped for mountaineering, while at least two should have a good knowledge of glacier work. Sleeping bags should be carried.

Thermal spring, Copland Valley. —*R. Warburton.*

Sullivan families and friends on the Fox Glacier, 1934.

Grahams' Franz Josef Hotel, 120 beds, 1938. (Destroyed by fire, 1954.)

Ice pinnacles on Fox Glacier. —*National Publicity Studios.*

Dead or black ice, Fox Valley. —*J. H. Taylor.*

Any interested party lacking the necessary experience should make provision for hiring a guide from the Mount Cook National Park. Time—six days.

CALLERY

Access to the peaks at the head of the Callery can be by ski-plane to the Geikie Snowfield, thence over the Spencer Saddle, down Cox's Couloir to the Cerberus Glacier. This is a difficult route. Time—one and a half days.

The Callery itself is heavily gorged, but an old track traverses the valley, starting 10 yards from the southern end of the swing bridge over the Callery River at Franz Josef. After one hour's travelling the track crosses to the true right bank, climbing to 2,000 feet then descending to 500 feet above the gorge. Then it continues generally at this level until a mile before the Callery-Spencer junction, where it again crosses to the true left, climbs over the foot of Drummond ridge to the Spencer Bivvy Rock, which is situated 300 feet above the Spencer River near the Spencer-Callery junction. The track at present is overgrown and the bridges are out. Time—two to three days.

COOK RIVER—LA PEROUSE GLACIER

The La Perouse Glacier, source of the Cook River, is a trip of two to three days with heavy packs, over rough country of river-bed and bush. In the lower reaches of the glacier, bivvy rocks are used, while at a greater elevation snow caves are the best means of accommodation. Crossings of the Main Divide are possible from these positions via Harper Saddle to the Upper Hooker Glacier and the Empress Hut, or via Clark Saddle (9,784 feet), to the Linda Glacier and down to the Grand Plateau Hut.

As both these saddles are heavily glaciated, the traverse routes and their feasibility alters from day to day.

KARANGARUA

Leaving the Karangarua Road Bridge, follow the true left bank, over river-bed, bush-clad terraces, and grassy flats to near the junction of the Copland and Karangarua Rivers; from there a well-blazed track leads through to Cassel Flat and then into the Upper Karangarua.

Fur seals, north of Gillespies Beach. —*J. H. Taylor.*

GUIDING

At present there are no guides available for high climbing in the Park, and all inquiries regarding guiding facilities should be made to the Mount Cook National Park.

SKI-MOUNTAINEERING

The Franz Josef and Fox Névés provide excellent opportunities for ski-mountaineering, which coupled with the excellent siting of the new Pioneer Hut at the head of the Fox Névé, should prove increasingly popular.

Easy of access by ski-plane, but difficult on foot, these névés require a good knowledge of ice work.

All skiers entering the area should have this knowledge and the necessary equipment or be accompanied by a guide.

TRACKS AND TRAMPING

WESTLAND National Park and the areas surrounding it offer a remarkable variety to the tramper. There are easy tramps along the sea coast and open valleys, where magnificent views of the Main Divide can be obtained in clear weather, graduating to some of the rugged valleys and ranges nearer the mountains.

Trampers are encouraged to seek the advice of Park Rangers before setting out on a journey. Helpful advice can make a trip easier, safer, and more interesting.

It must be realised that Westland National Park is a rain-forest area having periods of very heavy rain, particularly during the spring and early summer. Trampers will be wise to be prepared for these conditions and have adequate waterproof clothing and footwear. Rivers and streams rise very rapidly. They also go down rapidly after rain ceases. It is wise to have patience and wait rather than risk a dangerous crossing.

Intentions Books are maintained in Park Offices at Franz Josef Glacier and at Fox Glacier, and also in huts. It is essential for trampers to record intentions before departing on a tramping trip.

A few of the more commonly used tramping areas and tracks, in and near the park, are listed.

OKARITO—14 miles from Franz Josef Glacier.

From Okarito the coastal strip southwards rewards the tramper with some of the finest views obtainable of the Southern Alps. From the Three Mile and the Five Mile Lagoons the views are superb. Seals are often to be seen on these and other beaches throughout South Westland.

The track to the Trig Point at Okarito is a well-known vantage point renowned for its views of the Main Divide. The

outlook both northwards and southwards along the coast is also rewarding.

A boat crossing of the Okarito Lagoon leads to the narrow northern coastal strip separating the inland waterway from the open sea. This is a fascinating area for water-birds.

WAIHO BEACH.

The river flowing from the Franz Josef Glacier is the Waiho River and the river valley and beach are good tramping areas. A short tramp along the beach to the south leads to the Omoeroa Bluff, which commands an uninterrupted view of the mountain chain.

GILLESPIES BEACH.

Gillespies Beach is 13 miles from Fox Glacier Township. The first seven miles are through open, flat, farming country where splendid views of forest and high mountains are to be seen.

Possibly one of the finest views obtainable is at the Clearwater River, where a short time spent walking up or down the stream bed will reveal pools giving reflections of Fox Glacier, Mount Tasman, Mount Cook and many other peaks as well as the forest-clad lower slopes.

The road continues through native bush to Gillespies Beach. A walk of an hour along the beach brings the visitor to rocks where seals may sometimes be found sunning themselves.

From the northern end of the old bridge across the lagoon a track leads inland and up to a tunnel through the ancient piedmont moraines forming the headland. This tunnel was cunningly constructed by the early settlers, and is a link in the old coast route. The track continues up to a trig point from which excellent mountain and coastal views may be seen.

Gillespies Beach was once a thriving area in the days of Westland's goldrush, when over 2,000 people earned a living sifting the dark sands for gold. An old dredge and other relics are still to be seen in the area.

ALEX KNOB—4 hours (up).

Commencing one mile along the Glacier Approach Road to the Franz Josef Glacier, and climbing to the summit of Alex Knob at 4,288 feet above sea-level, this well-graded track is popular with visitors of all ages.

The great variety of the rain-forest will be noticed along the lower portion of the track. Ferns, mosses, seedling trees, prostrate and climbing vegetation compete for light and room on the forest floor. Above these the sapling rimu, miro and totara in company with bushy coprosmas, fuchsia, pate, lancewood and kamahi form a dense canopy or under-storey below the spreading crowns of adult rata, totara, miro and slightly lower kamahi.

Christmas Outlook, at about 3,000 feet, gives a fine view of the Franz Josef Glacier framed by sub-alpine vegetation. The sub-alpine belt continues to about 4,000 feet, where it abruptly ceases and tussock and alpine plants take over. These include many lovely alpine flowers.

The tramper is rewarded at the finish of the six-mile gradual climb by the magnificent panorama of high mountain peaks at the head of the Franz Josef Glacier, and a remarkable view of the entire length of the glacier as it descends from the vast snowfields at the head to the riverbed far below.

A peak indicator on the tussock identifies the mountains near and far, and also the lakes seen in the distance to seaward, north and south.

ROBERT'S POINT—3½ hours (up).

The Robert's Point Track is on the other side of the Franz Josef Glacier Valley from the Alex Knob Track, and can be approached either from the Callery Track or from the Douglas Track and across the Waiho foot bridge.

Many fine views of the valley and of Franz Josef Glacier are visible on this route, the highlight being the view from the Point itself which commands a superb view of the lower ice-fall. An interesting feature of this walk is the clearly defined trim line on either side of the valley about 900 feet above the river bed. This trim line records the height of the Franz Josef Glacier in the year 1750, the lighter-coloured smaller trees below the trim line level having developed as the glacier receded.

ALPINE GARDEN AND CRAIG PEAK—3 hours to Alpine Garden; 5 hours to Craig Peak.

These climbs lead from the Cone Ridge Track and follow a stream bed. The Cone Ridge Track begins from the end of the Southern Approach Road of the Fox Glacier. The views from both the Alpine Gardens and Craig Peak are superb. It is wise

to discuss conditions with a Park Ranger before setting out for Craig Peak.

MOUNT FOX—2½ hours to Trig Point, 3,352 ft a.s.l.; 3½ hours to summit, 4,391 ft a.s.l.

The track starts from the southern bank of Thirsty Creek, which is about half a mile south of the Fox River bridge. The going is fairly steep. Just beyond the trig you rise above the scrub-line and enter the true alpine herb-field, from which you may scan the coast, the ancient piedmont moraines, and the entrapped lakes, Gault and Mueller. There is a grand panorama of the Fox Glacier, the Fox Névé of over 7,000 acres and numerous mountain peaks.

THE COPLAND TRACK.

Sixteen miles south of Fox Glacier Township and 100 yards north of the Karangarua River bridge is the start of the Copland Track. This track follows the Copland Valley to the Copland Pass which gives access to Mount Cook National Park. It is emphasised that the Copland Pass itself is for experienced climbers only.

The walk up the Copland Valley is a delightful experience for the reasonably fit. Welcome Flat, five and a half hours' tramping from the main highway, is at a height of 1,400 feet above sea-level. Here in the sheltered valley are hot springs where the tramper can relax amid forest trees and snow-clad peaks. There is a hut at Welcome Flat with a living-room and two bunk-rooms each containing eight bunks.

Another three hours' walk brings the tramper to Douglas Rock Hut, nearer the head of the Copland Valley. It is from Douglas Rock Hut that the majority of climbers depart on the journey over the Copland Pass to the Hooker Hut or to the Headquarters at Mount Cook National Park.

A charge is made for the use of both the Welcome Flat Hut and Douglas Rock Hut. Permission should be obtained from Park Headquarters at Franz Josef Glacier, or from the Park Office at Fox Glacier.

WALKS

FRANZ JOSEF GLACIER TRACK—40 minutes (out).

A LITTLE beyond the car park at the end of the road, track signs point to the route to the glacier. In reasonable weather little difficulty is experienced in following a route to the glacier, and in winter-time, when there is less variation in the rainfall it is usually possible to walk up the shingle bed of the valley to where the track leads off to the right over rock formation.

CALLERY GORGE AND WARM SPRINGS—30 minutes (out).

This pleasant walk runs alongside the Waiho and Callery Rivers to the Callery Gorge (one mile) and on to the Warm Springs (another half a mile) which flow into the Waiho River.

The walk as far as the Springs is intersected by many man-made water-races constructed at the turn of the century. The iron and wooden pipes used for carrying the water are silent testimony to an era and race of men who formed this track for access among the gold workings.

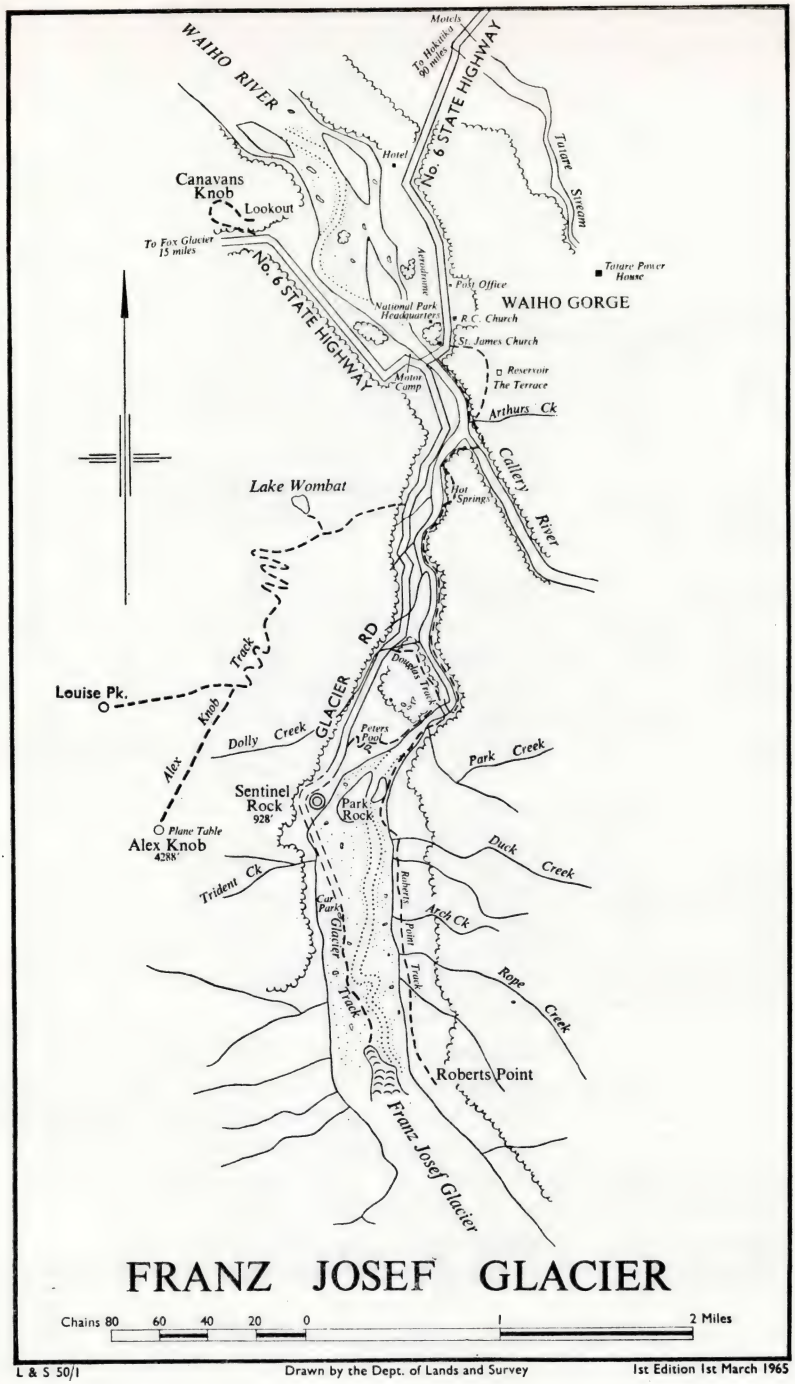
The vigorous regeneration of many of the broadleaved species of vegetation has healed over mined areas and shades the track. Moss adorns every tree and the profuse growth of the many ground plants makes a sponge-like carpet throughout the forest floor. For the botanist this is an enchanting walk. Tree and ground orchids are plentiful.

THE TERRACE—20 minutes.

A branch track of the Callery Track, the Terrace Track branches off ten minutes' walk from the road and loops back to come out near the Roman Catholic Church. A considerable quantity of gold was taken from the Terrace and now young rata trees grow thickly over the old scars of excavation.

PETER'S POOL—5 minutes from Franz Josef Glacier Road.

Peter's Pool, which mirrors the Franz Josef Glacier, can be



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reached either from the Douglas Track, which branches from the Glacier Approach Road, or from a crossing of the Waiho suspension foot bridge on the branch from the Robert's Point Track.

DOUGLAS TRACK—35 minutes.

Douglas Track branches from the Glacier Approach Road, leads round on to Peter's Pool, or over the Waiho foot bridge to the Robert's Point Track, or back to the Callery Track.

LAKE WOMBAT—50 minutes (out).

The track to Lake Wombat starts one mile up the Franz Josef Glacier Approach Road at the same point as the Alex Knob Track, from which it branches after one mile, to descend gently a short distance to Lake Wombat fringed by rata, rimu, miro and totara. Ducks and little grebe or dabchick (which are rare) inhabit this lake, the dark waters of which give excellent reflections. In this peaceful setting, fantails, tom-tits, bellbirds, tuis, kakas and occasional keas fill the air with lively notes.

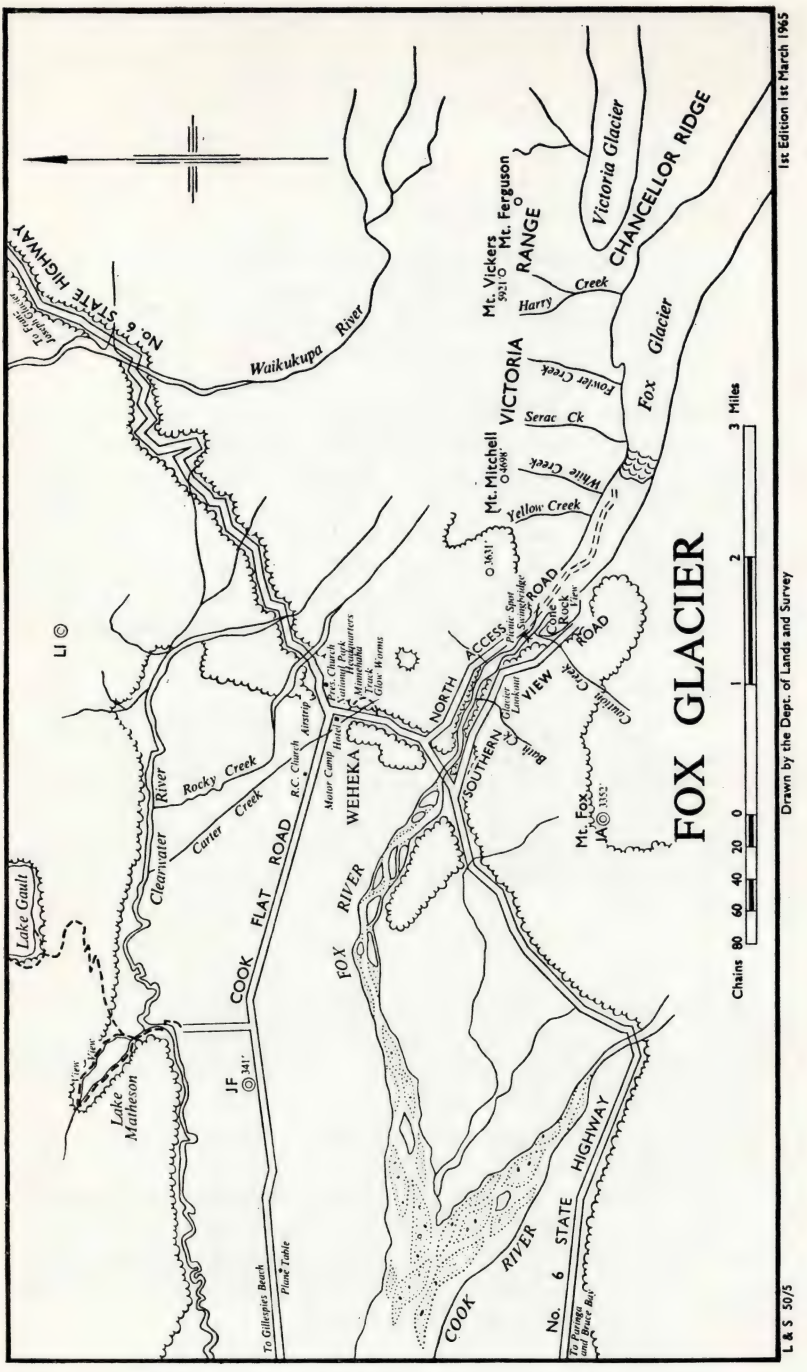
CANAVANS KNOB—20 minutes (up).

Less than two miles from Franz Josef Glacier Township on the Main Road South is the track sign leading to Canavans Knob. The track rises gradually to near the top of the Knob, where there is an interesting panorama of the Franz Josef Glacier and some of the high peaks of the Main Divide. There are also cleared vantage-points looking seawards at stages along the track.

FOX GLACIER.

Occasionally the latter portion of the Northern Approach Road to the Fox Glacier is washed out and it is necessary to walk a few additional hundreds of yards, but the usual walk is of a quarter of a mile only from the car park.

About two and a half miles up the Approach Road, in the riverbed below Cone Rock, will be seen the first great masses of dead ice left there when the glacier receded from this point many years ago. The visitor will notice high on the valley sides the clearly-cut trim line where the lighter coloured smaller tree-growth meets the darker old trees, showing the height at which the glacier moved just over 200 years ago.


FOX GLACIER
No. 6 STATE HIGHWAY
Waikukupa River
Lake Gault
Lake Matheson
Clearwater River
Rocky Creek
Carter Creek
COOK FLAT ROAD
WEHEKA
FOX RIVER
COOK RIVER
No. 6 STATE HIGHWAY
NORTH ACCESS ROAD
SOUTHERN VIEW ROAD
Mt. Vickers 9210
Mt. Ferguson
RANGE
Victoria Glacier
CHANCELLOR RIDGE
Harry Creek
VICTORIA
Forster Creek
Serac Ck
Fox Glacier
Mt. Mitchell 4698
White Creek
Yellow Creek
Mt. Fox 3352
JF 341
LI
Chains 80 60 40 20 0 1 2 3 Miles
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GLACIER ROAD PICNIC SPOT.

One mile up the Northern Approach Road is a picnic spot with table and seats, fireplace and toilets. From here a track leads over the suspension bridge to the Fox River Tracks and to the Southern Approach Road on the other side of the Fox River.

MINNEHAHA TRACK—20 minutes.

Two hundred yards along the main highway south of Fox Glacier Township is the entrance to Minnehaha Track, a loop track coming out further along the road. About half a mile long, it is an easy, nearly flat, all-weather track.

The moss-covered trees and wealth of ferns make this an outstanding introduction to the rain forest of Westland National Park.

GLOW-WORMS.

Adjacent to Minnehaha Track. This walk-around grotto is well worth a visit at night.

LAKE MATHESON—car park to lake 20 minutes; car park to raft 30 minutes; car park to end of lake 1 hour; complete round-the-lake walk 2 hours.

Follow the road from Fox Glacier Township towards Gillespies Beach for almost three miles, branching right to drive to the car park. An easy walk through interesting, labelled forest trees and shrubs brings the visitor to the lake. The booklet "Lake Matheson Forest Walk," obtainable at Park Headquarters, will aid your enjoyment of this gem of nature.

Famous for its magnificent reflections of New Zealand's two highest peaks, to the right Mount Cook (12,349 feet) and on the left Mount Tasman (11,475 feet), the highest point in Westland National Park, Lake Matheson is one of the most-visited spots.

The brown water, coloured with humus leached from the vegetation of the forest floor, is often completely untouched by wind, especially in the early morning and during the evening, making a perfect mirror for reflected views.

The track leads right around the lake to several vantage points, including a short walk from the boat anchorage to a moored raft for reflection pictures. Birds are plentiful in the

forest surrounding the lake and bird-lovers will enjoy their remarkably clear song, Lake Matheson acting as a sound-shell as they call to each other across the still waters.

LAKE GAULT—1½ hours to lake.

Lake Gault is located high on piedmont moraines to the north of Lake Matheson, the track branching off from the Matheson Track. There is some climbing on a well-graded track, but any reasonably fit person will have no difficulty. A side track, while descending to the lake, leads off to a point where beautiful reflected views of the Alps may be obtained. The sighting of kakas and crested grebes is not unlikely. An enjoyable half-day or day trip.

FOX RIVER TRACKS—10 minutes to Glacier Road Picnic Spot; 15 minutes to foot of Cone Rock.

The starting point is the car park at the end of the Southern Approach Road. Facing up the valley the track on the left leads down to the Fox River. After a short descent, a track branching to the left takes you to the suspension bridge and the picnic spot on the Northern Approach Road. Straight ahead from the car park you soon come to a track to the right which follows an old trail used many years ago when nearly all visitors went on to the glacier from the south side. This track leads to the foot of Cone Rock, at which point there used to be access straight on to the glacier. The summit of Cone Rock is 910 feet above the Fox River bed.

For those interested in botany this is a fascinating area where regeneration of the forest is taking place following the recession of the Fox Glacier from the valley floor.

CONE ROCK—40 minutes to summit, 1,640 ft a.s.l.

Cone Rock Track leaves from the parking area at the end of the Southern Approach Road. The track is rather steep, but the views are wonderfully rewarding, giving vistas of the Fox Glacier for its entire length and of the peaks surrounding the huge snowfields. Ice filled the valley to the top of Cone Rock about the year 1750.

FOX CHALET AND CONE RIDGE—30 minutes to Fox Chalet Hut; 35 minutes to view of Fox Glacier.

From the Southern Approach car park follow the Cone Rock Track, keeping ahead at the Cone Rock turn-off. The Fox

Chalet Hut is not far beyond Mills Creek. Another five minutes takes you to a grandstand view of the lower portion of the glacier from the terminal face to the pinnacles.

THE PEAKS AT SUNSET.

Walk down the Gillespies Beach Road and the peaks begin to come into view soon after leaving the village; or drive down to the classic vantage point near the Clearwater River, seven miles from the township and the best viewpoint at lower levels for the névé and main ice-fall of the Fox Glacier.

FISHING

FOR the angler in Westland National Park there are brown trout, sea-run and land-locked salmon. Fly fishing, spinning and trolling are all permitted and good catches can be taken by using any of these methods.

Lake Wahapo: Until recently it was considered that the land-locked salmon in this lake were fished out. However, increasing numbers of these fish are being taken and good catches have been recorded. Brown trout also provide good sport. Fish average 2-3 lb.

Lake Mapourika: This is considered the better of the two lakes for angling, although few brown trout are caught. Land-locked salmon range from 1 lb to 3½ lb, but the occasional heavier fish is caught. During the 1964-65 season a 12 lb sea-run salmon was caught in this lake.

Okarito River runs out of Lake Mapourika and is good fast water. Brown trout and the occasional salmon may be caught here.

Karangarua River provides good brown trout fishing.

Licences to fish the waters within the Park may be obtained at Whataroa, Franz Josef and Fox Glacier, and anglers are requested to make themselves fully conversant with the regulations as to various types of bait and bag limits.

The Westland Acclimatisation Society (not the Park Board) controls the fishing within the lakes and rivers.

Using the Park as a base, some excellent fishing can be obtained, in the Makawhio (Jacobs), Mahitahi, Paringa, and the Moeraki Rivers and Lake Paringa and Lake Moeraki. Sea-run salmon and brown trout are found in Lake Paringa and Lake Moeraki and the rivers of those names; in Makawhio and Mahitahi Rivers, only brown trout occur. The boundary between Westland and Southern Lakes Acclimatisation

Districts is the Makawhio River; anglers should be aware of this as different regulations apply. Licences to fish in Southern Lakes District can be obtained at the Paringa Motels, Bruce Bay Store and from Mr G. Thompson at Haast.

In the 1964-65 season the largest fish recorded was taken in the Paringa-Moeraki area; this was a 17 lb sea-run salmon.

Sea Fishing: For the surf-casting enthusiast, good sea fishing can be obtained off the beaches at Okarito and Bruce Bay. The most common species of fish taken are snapper, red cod, gurnard, kahawai and sharks.

SEARCH AND RESCUE

THE Search-and-Rescue Units throughout the North and South Islands are part of a nation-wide organisation whose purpose is basically to save lives at sea or on land.

Covering a wide field from mountaineering accidents to small boats lost around our coasts, conditions are often hard and the work dangerous for the personnel involved, mostly volunteer amateur sportsmen from various walks of life.

Prevention is better than cure, so while in the Park please observe the following rules, remembering that for a foolhardy or thoughtless action there quite often is no cure.

All climbing, tramping or hunting parties should report to a Ranger at either Franz Josef or Fox Glacier to fill in the intentions book which is provided for your safety and our information should a party become overdue.

These log books are also standard equipment in all Park Huts and all parties, whether or not they are just passing, should make an entry.

Know your party and its capabilities. If plans include the traverse of a névé or glacier, ascertain that all members understand their equipment and the details of crevasse rescue.

Keep your party together at all times.

Do not travel in marginal conditions unless it is absolutely imperative. Get your party out of the wind; a crevasse or snow-cave will give adequate protection. You should have food in your pack, eat frequently and keep warm.

Do not climb alone; even a slight injury could have serious consequences.

An injured person should not be left alone unless by doing so you can bring help quickly; otherwise it is better to await a search party which must arrive if you have taken the proper precautions.

Before leaving, mark the position of the injured party and take careful note of the surroundings; if possible make a written note.

Assist searchers by signalling with torch, compass mirror, smoke, shouting, waving, marking the snow. Remember, that a low-flying plane could be looking for you.

When someone is overdue this fact should be reported to the nearest Police or Park Ranger; the necessary steps will then be taken by the Search-and-Rescue Organisation.

SERVICES

TRANSPORT.

Railcar.—There is a daily railcar service, Christchurch to Ross, and Ross to Christchurch.

Bus.—Regular services operate from Nelson to Hokitika, and Hokitika to Nelson.

There is a daily service from Hokitika to Fox Glacier, from Fox Glacier to Hokitika, and also a daily service from Franz Josef Glacier to Queenstown, and from Queenstown to Franz Josef Glacier during summer months. Reduced services in winter.

Air.—Regular services operate to Hokitika. Several times weekly a service operates from Hokitika to Franz Josef Glacier and Fox Glacier.

Roads.—The standard of roading throughout the Westland National Park area is being steadily improved, and with the main highway traversing the Park there is good access from both north and south.

SCENIC FLIGHTS.

One of the highlights of a visit to Westland National Park is a flight into the mountain area. The visitor can book a flight either with or without landing on one of the vast snowfields at the head of the Franz Josef Glacier or the Fox Glacier. Booking of flights is through hotel or camping ground offices.

GUIDED TRIPS.

Guided trips to the glaciers are organised daily from the hotels at Franz Josef Glacier and at Fox Glacier. Suitable equipment can also be hired for a glacier trip.

CAR TRIPS.

For visitors with cars who enjoy a trip away from base at Franz Josef Glacier or Fox Glacier the following journeys are of special interest.

Okarito.—14 miles from Franz Josef Glacier. A place of historic interest. Once a thriving gold-mining centre with some of the old buildings still standing. (See paragraph under Tracks and Tramping.)

Gillespies Beach.—13 miles from Fox Glacier. With a history similar to that of Okarito. (See paragraph under Tracks and Tramping.)

Lake Mapourika and Lake Wahapo.—Five miles and nine miles north of Franz Josef Glacier.

Hunts Beach.—22 miles south of Fox Glacier.

Bruce Bay.—30 miles south of Fox Glacier.

Lake Paringa.—40 miles south of Fox Glacier.

Lake Moeraki—50 miles south of Fox Glacier.

It is worth noting that often when cloudy at Franz Josef Glacier or at Fox Glacier, the conditions are clear and sunny at or near the coastline.

Advice and assistance is always available at the offices of the Westland National Park at Franz Josef Glacier and Fox Glacier, where spacious visitor centers are planned, the one at Fox Glacier being virtually ready for occupation.

FOX VISITOR CENTER

This Center is the result of the combined enthusiasm of Westland National Park Board Members and Staff, and the local people of Fox Glacier—and the helpful interest, backing and support of the National Parks Authority.

In a demonstration of faith in the project and keenness to get things moving, the community of Fox Glacier (a tiny township of 25 homes) raised £1,500 in the first twelve months towards the Center, and further generous donations are still being made.

Provision has been made for the following facilities:

External:

1. Children's Playing Area.
2. Picnic Area.
3. Native Gardens and Rockeries.
4. Vehicle Parking.

Internal:

1. Vehicle Covered Way.
2. Entrance Foyer and Display Area.
3. Information Office.
4. Rangers' Office.
5. Main Hall (seating over 300 people) caters for:
   (a) Main Lecture Hall.
   (b) Full Badminton Court.
   (c) Dances, Socials, Youth Activities.
   (d) Slide and Film Evenings.
6. Natural History Room—Serving:
   (a) Natural History Display and Instruction.
   (b) Slide Talks and Films (seats up to 90).
   (c) Bowling (Indoor).
   (d) Social and Youth Activities.
7. Kitchen—Providing:
   (a) Catering and Washing-up Facilities.
   (b) Doctor's Surgery. (Weekly District visit.)
   (c) Plunket Room.
8. Public Conveniences.
9. Basement—Making provision for:
   (a) National Park Workshop and Storage.
   (b) Search and Rescue Base.
   (c) Garage for South Westland Ambulance.
   (d) Garage for Local Fire-tender.

Keen interest is being shown in the building as a base for conventions, particularly for the winter period when South Westland experiences its loveliest weather.

Planning, organisation, and building supervision has been the work of the Chief Ranger, Mr Gordon Nicholls, an ex-builder.

IT IS *YOUR* PARK

National Parks are set aside to preserve in perpetuity natural areas of New Zealand so that people may derive inspiration, enjoyment and recreation from mountains, forests, fiords, lakes and rivers. The National Parks Authority was established under the National Parks Act 1952 " to control in the national interest the administration of all National Parks in New Zealand ". Under the general supervision of the Authority a local National Park Board controls each of the 10 parks—Urewera, Tongariro, Egmont, Abel Tasman, Nelson Lakes, Arthur's Pass, Mount Cook, Westland, Mount Aspiring and Fiordland.

Visitors to National Parks can help preserve the parks for their own enjoyment and that of future generations, by observing the National Parks Code of Behaviour:

All birds, native animals, plants and natural features are protected.

Fires may not be lit without authority except at camping sites or picnic areas. All fires should be in safe places and must be properly extinguished. Use only dead wood for fuel.

Place rubbish in containers where provided, otherwise burn or bury.

Dogs and cats may not be brought into a Park without authority.

Camp sites, picnic areas, and huts should be left clean and tidy with firewood replenished.

Firearms may not be taken into a Park without authority.

ACKNOWLEDGMENTS

THIS HANDBOOK is the result of a team effort and many people have assisted in its planning and production. The Westland National Park Board wishes to record its sincere thanks for special assistance to:

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Mr K. Mawhinney, N.Z. Forest Service, for " Introduced Animals ".

Mr P. S. McCormack, Franz Josef Glacier, for " Gold ".

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MAP OF

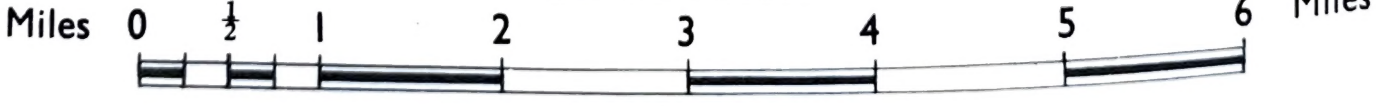
WESTLAND

NATIONAL PARK

Published by the Dept. of Lands and Survey, N.Z.,
under the Authority of R. P. Gough, Surveyor-General

National Park Boundaries,

SCALE 1:150000



1 Inch to 190 chains (approx)

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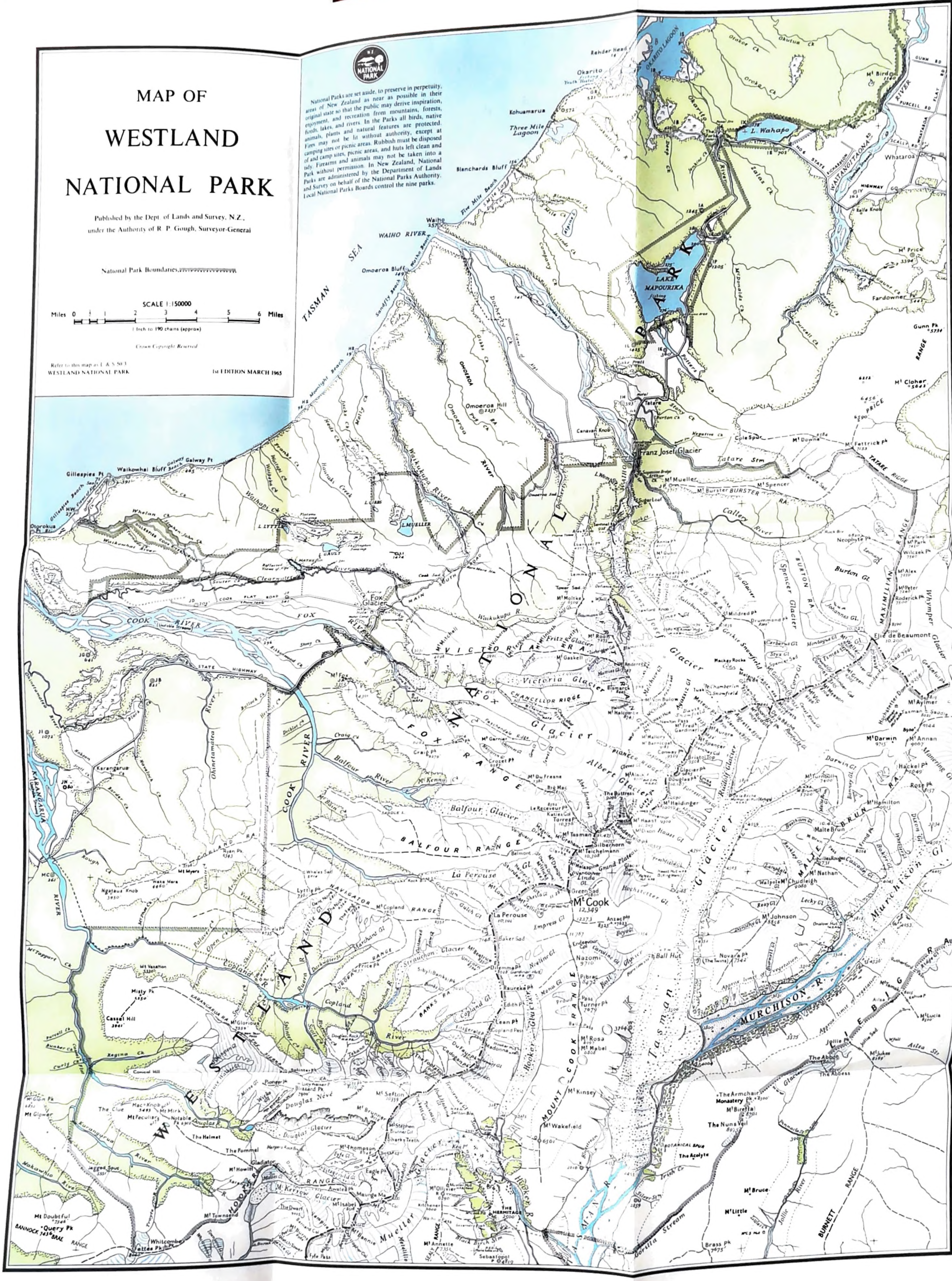
1st EDITION MARCH 1965


MAP OF
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National Park Boundaries
SCALE 1:150000
Miles 0 ½ 1 2 3 4 5 6 Miles
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NATIONAL PARK
National Parks are set aside, to preserve in perpetuity, areas of New Zealand as near as possible in their original state so that the public may derive inspiration, enjoyment, and recreation from mountains, forests, fiords, lakes, and rivers. In the Parks all birds, native animals, plants and natural features are protected. Fires may not be lit without authority, except at camping sites or picnic areas. Rubbish must be disposed of and camp sites, picnic areas, and huts left clean and tidy. Firearms and animals may not be taken into a Park without permission. In New Zealand, National Parks are administered by the Department of Lands and Survey on behalf of the National Parks Authority. Local National Parks Boards control the nine parks.
TASMAN SEA
WAIHO RIVER
WESTLAND NATIONAL PARK
COOK RIVER
FOX RIVER
Franz Josef Glacier
Fox Glacier
LAKE MAPOURIKA
L. Wahapo
Okarito
Whataroa
Fox Glacier
Franz Josef Glacier
Victoria Glacier
Balfour Glacier
La Perouse
Mt Tasman
Mt Cook 12,349
Tasman Glacier
Hooker Glacier
Mueller Glacier
MURCHISON R.
THE HERMITAGE
VICTORIA RA.
FOX RANGE
BALFOUR RANGE
NAVIGATOR RANGE
MOUNT COOK RANGE
MALTE BRUN RA.
LIEBIG RA.
KARANGARUA RIVER
Copland River